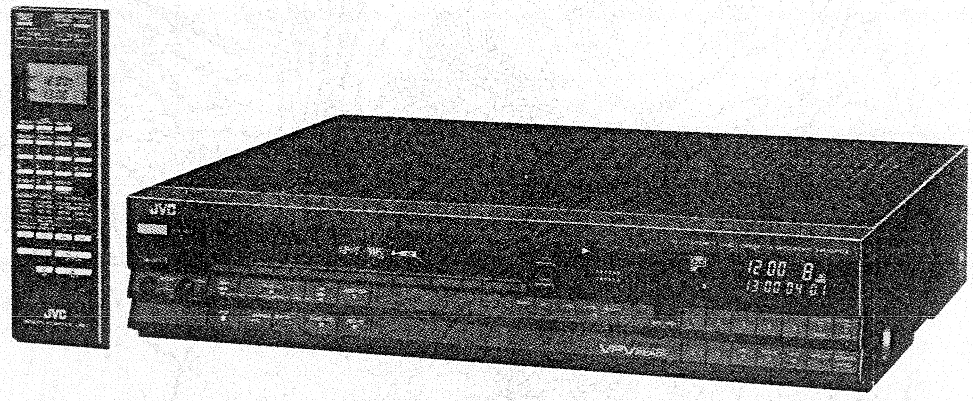
# JVC

# SERVICE MANUAL

## Hi-Fi STEREO VIDEO CASSETTE RECORDER VHS PAL

# HR-D750E/EG



HQ

VPV VIDEOTEXT PROGRAMM READY

INDEX
VHS INDEX SEARCH SYSTEM

## SPECIFICATIONS

| | |
|---|---|
| Format | VHS PAL standard with Hi-Fi audio |
| Video recording system | Rotary two-head helical scan system with a slant double-azimuth combination video head |
| Hi-Fi audio recording system | Deep-layer recording system conforming to stereo Hi-Fi VHS standard |
| No. of audio channels | 2 Hi-Fi audio channels<br>1 normal audio channel |
| Video signal system | PAL colour and CCIR monochrome signals, 625 lines |
| Tape width | 12.65 mm |
| Tape speed (SP) | 23.39 mm/sec |
| (LP) | 11.70 mm/sec (Hi-Fi audio only) |
| Maximum recording time (SP) | 240 min. with E-240 video cassette |
| (LP) | 480 min. with E-240 video cassette (Hi-Fi audio only) |
| Temperature | |
| Operating | 5°C to 40°C |
| Storage | −20°C to 60°C |
| Power requirement | 220 V∿, 50/60 Hz |
| Power consumption | 35 W |
| **Video** | |
| Input | 0.5 to 2.0 Vp-p, 75 ohms, unbalanced |
| Output | 1.0 Vp-p, 75-ohms, unbalanced |
| Signal-to-noise ratio | 43 dB (Rohde & Schwarz noise meter) with picture sharpness control at centre position |
| Horizontal resolution | 250 lines with picture sharpness control at centre position |

| | |
|---|---|
| **Audio** | |
| Input | Mic: −67 dBs, high impedance, unbalanced<br>AUDIO IN connector (RCA x 2): −8 dBs, 50 k-ohms, unbalanced<br>AUDIO/VIDEO socket (21-pin Peri connector): −3.8 dBs (CENELEC standard), 10 k-ohms, unbalanced |
| Output level | AUDIO/VIDEO socket (21-pin Peri connector): −3.8 dBs (CENELEC standard), high impedance load<br>AUDIO OUT connector (RCA x 2): −6 dBs, high impedance load |
| Output impedance | Less than 1 k-ohm, unbalanced |
| Signal-to-noise ratio | More than 40 dB |
| Frequency range | 70 Hz to 10,000 Hz |
| **Hi-Fi audio** | |
| Frequency response | 20 Hz – 20,000 Hz |
| Dynamic range | More than 90 dB |
| Wow and flutter | Less than 0.005 % WRMS |
| **TV tuner/RF section** | |
| Channel storage capacity | 48 channels |
| Aerial input | VHF 47 – 89 MHz<br>104 – 300 MHz<br>302 – 470 MHz<br>UHF 470 – 862 MHz |
| Aerial output | UHF channels 32 – 40 (Adjustable) |

| | |
|---|---|
| **Digital clock/timer** | |
| Clock display | 24-hour fluorescent digital display with day and date indication |
| Reference frequency | Quartz controlled |
| Start time setting | Within one year |
| Programming capacity | 8 programmes |
| Dimensions | 435 mm(W) x 95 mm(H) x 332 mm(D) |
| Weight | 6.8 kg |
| Provided accessories | Aerial cable,<br>Infrared remote control,<br>"R6"-size battery x 2,<br>Audio cable (RCA-RCA) |
| Optional accessory | VPS adapter (VU-V110E)<br>VPV adapter (VU-V120E)<br>VPS/VPV adapter (VU-V100E) |

*Specifications shown are for SP mode unless otherwise specified.*
*Design and specifications subject to change without notice.*

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No. 82067
August 1988

**NOTE: For a technical description, please refer to Technical Guide VTG82027 HR-D750 PAL.**

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# Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

## ● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
Replace only with specified part numbers.
**Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.**

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

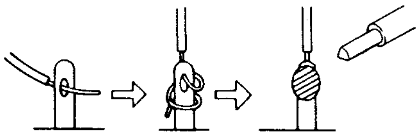


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

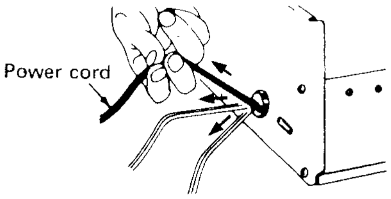


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
   1) **Connector part number** : E03830-001
   2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
   3) **Replacement procedure**
      (1) Remove the old connector by cutting the wires at a point close to the connector.
      Important : Do not reuse a connector (discard it).

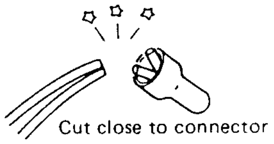


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

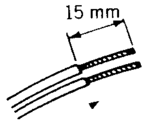


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

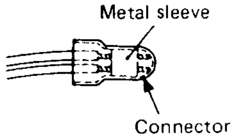


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

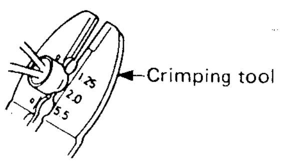


Fig. 6

(5) Check the four points noted in Fig. 7.

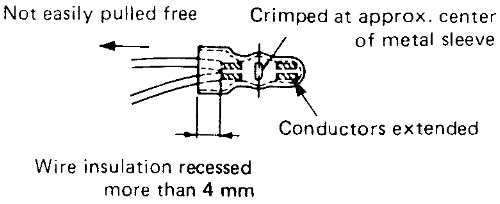

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

# ● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

**1. Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

**2. Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

**3. Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

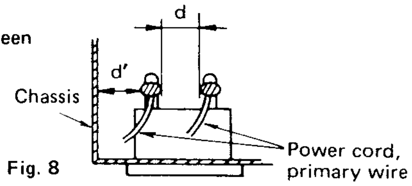


Fig. 8

**4. Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
**Measuring Method:** (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

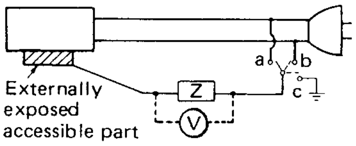


Fig. 9

**5. Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
**Measuring Method:**
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

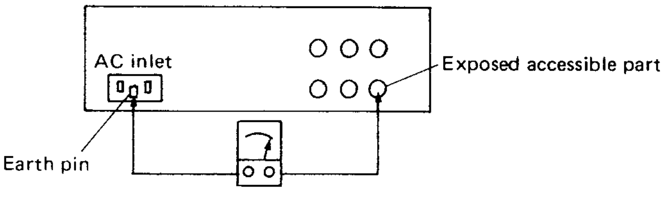


Fig. 10

**Grounding Specifications**

| Region | Grounding Impedance (Z) |
|---|---|
| USA & Canada | Z ≦ 0.1 ohm |
| Europe & Australia | Z ≦ 0.5 ohm |

| AC Line Voltage | Region | Insulation Resistance (R) | Dielectric Strength | Clearance Distance (d), (d') |
|---|---|---|---|---|
| 100 V | Japan | R ≧ 1 MΩ/500 V DC | AC 1 kV 1 minute | d, d' ≧ 3 mm |
| 100 to 240 V | | | AC 1.5 kV 1 minute | d, d' ≧ 4 mm |
| 110 to 130 V | USA & Canada | – | AC 900 V 1 minute | d, d' ≧ 3.2 mm |
| 110 to 130 V<br>200 to 240 V | Europe & Australia | R ≧ 10 MΩ /500 V DC | AC 3 kV 1 minute (Class II)<br>AC 1.5 kV 1 minute (Class I) | d ≧ 4 mm<br>d' ≧ 8 mm (Power cord)<br>d' ≧ 6 mm (Primary wire) |

Table 1 Specifications for each region

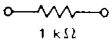
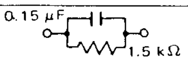
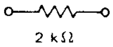
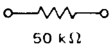
| AC Line Voltage | Region | Load Z | Leakage Current (i) | a, b, c |
|---|---|---|---|---|
| 100 V | Japan |  1 kΩ | i ≦ 1 mA rms | Exposed accessible parts |
| 110 to 130 V | USA & Canada |  0.15 µF 1.5 kΩ | i ≦ 0.5 mA rms | Exposed accessible parts |
| 110 to 130 V<br>220 to 240 V | Europe & Australia |  2 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Antenna earth terminals |
| | |  50 kΩ | i ≦ 0.7 mA peak<br>i ≦ 2 mA dc | Other terminals |

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

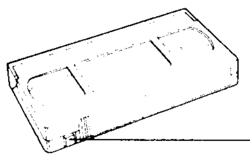
# PRECAUTIONS

**Handling and storage**

- Avoid using the recorder under the following conditions:
  - extremely hot, cold or humid places,
  - dusty places,
  - near appliances generating strong magnetic fields,
  - places subject to vibrations,and
  - poorly ventilated places.
- Be careful of moisture condensation.
  Avoid using the recorder immediately after moving from a cold place to a warm place or soon after heating a room which was cold. The water vapour in warm air will condense on the still-cold video head drum and tape guides and may cause damage to the tape and the recorder.
- Handle the recorder carefully.
  - Do not block the ventilation openings.
  - Do not place anything heavy on the recorder.
  - Do not place anything which might spill and cause trouble on the top cover of the recorder.
  - Use in horizontal (flat) position only.
- In case of transportion,
  - Avoid violent shocks to the recorder during packing and transportation.
  - Before packing, be sure to remove the cassette from the recorder.

**Video cassettes**

- This recorder employs VHS-type cassettes only.
  E-240 for 4 hours/8 hours, E-180 for 3 hours/6 hours, E-120 for 2 hours/4 hours, E-90 for 1 hour and 30 minutes/ 3 hours, E-60 for 1 hour/2 hours and E-30 for 30 minutes/ 1 hour of recording.
- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be performed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



- Avoid exposing the cassettes to direct sunlight. Keep them away from heaters.
- Avoid extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet) and dusty places.
- Place the cassettes in cassette cases and position vertically.

**Moisture condensation**

- If you pour a cold liquid into a glass, water vapour in the air will condense on the surface of the glass. This is called moisture condensation.
- Moisture condensation on the head drum, one of the most crucial parts of the video recorder, will cause damage to the tape.
- Moisture condensation is apt to occur under the following conditions:
  - when the recorder is moved from a cold place to a warm place, and
  - under extremely humid conditions.
- In conditions where moisture condensation may occur, keep the power cord plugged in an AC outlet and the OPERATE button set to ON; this would help prevent condensation from occurring. When condensation has occurred, it will not evaporate quickly once the power is switched on. Wait a few hours for the recorder to become dry.

**Operation**

- When a cassette is loaded, the power is switched on automatically.
- The cassette can be unloaded even when the power is off. Pressing the EJECT button turns the power on and, after ejection of the cassette, shuts it off automatically in this case.
- As long as the TIMER button is engaged with the TIMER indicator lit, the OPERATE and EJECT buttons have no effect and unloading of a cassette is not possible. If a cassette has not yet been inserted, simply insert a cassette; the power will be switched on to load the cassette properly and, after completion of automaitc loading, the Timer Recording Standby mode will be engaged with power off.

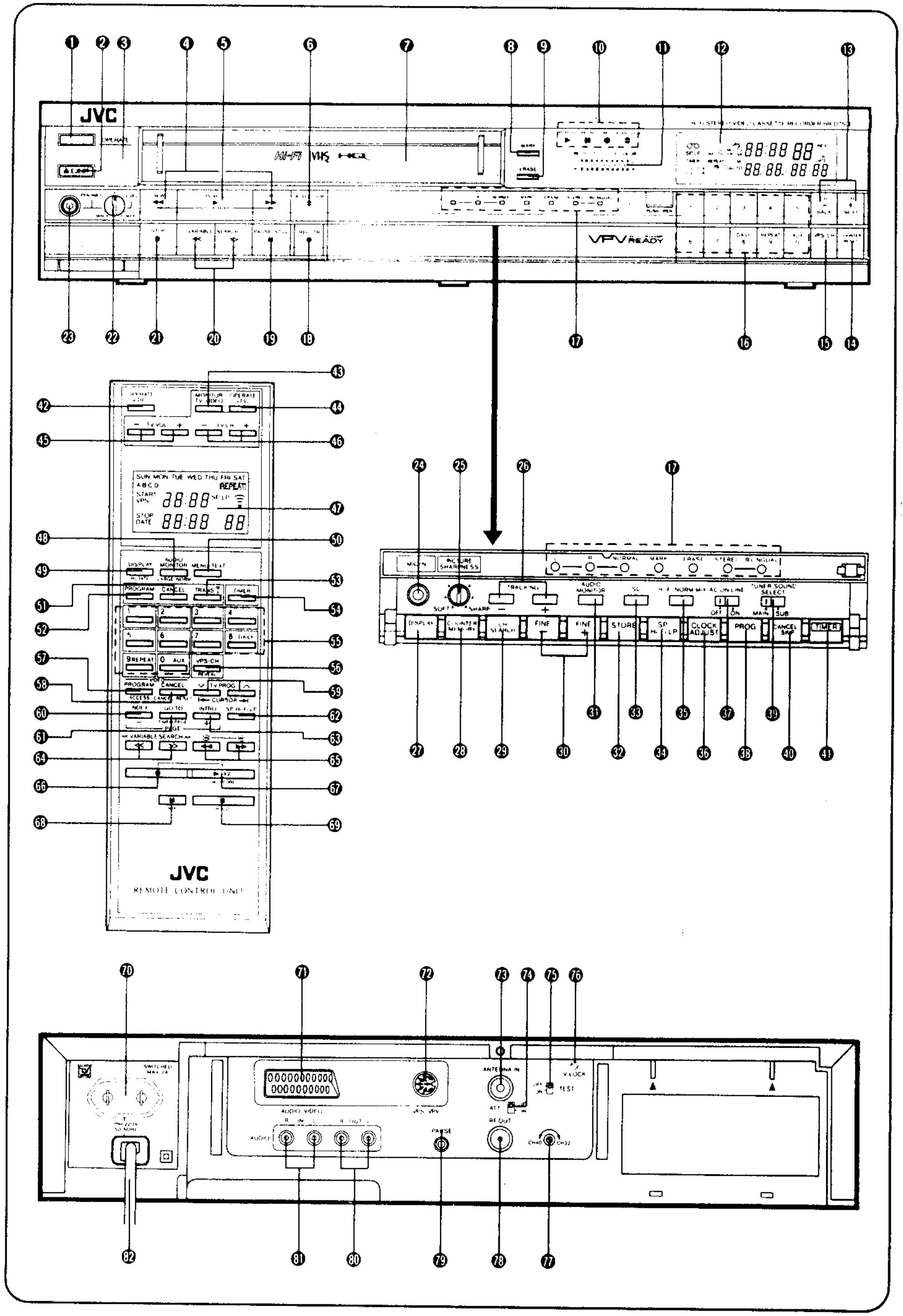
**Remote control unit**

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

WARNING

1. This recorder can also receive SECAM colour television signals for recording and playback.
2. Recordings made of SECAM television signals produce monochrome pictures if played back on another video recorder of SECAM standard, or do not produce normal colour pictures if played back on another video recorder of PAL standard.
3. SECAM prerecorded cassettes or recordings made with a SECAM video recorder produce monochrome pictures when played back with this recorder.
4. This recorder cannot be used in France. Use a SECAM recorder to record French SECAM signals in France.

**IMPORTANT:** It is permissible to record television programmes only in the event that third party copyrights and other rights are not violated.



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## SAFETY PRECAUTIONS

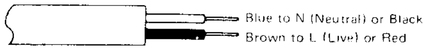
The rating plate and the safety caution are on the rear of the unit.

WARNING – DANGEROUS VOLTAGE INSIDE
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

IMPORTANT (In the United Kingdom)
Mains Supply (240 V~, 50 Hz only)

IMPORTANT

Do not make any connection to the Larger Terminal coded E or Green. The wires in the mains lead are coloured in accordance with following code:



If these colours do not correspond with the terminal identifications of your plug, connect as follows:
Blue wire to terminal coded N (Neutral) or coloured Black.
Brown wire to terminal coded L (Live) or coloured Red
*If in doubt – consult a competent electrician.*

FOR YOUR SAFERY (in Australia)
Install any external aerial to AS 1417. 1

**Omkopplaren OPERATE på denna apparat är sekundärt kopplad och skiljer inte apparaten från nätet i läge OPERATE OFF.**

The OPERATE button does not completely shut off mains power from the unit, but switches operating current on and off.

**BEMAERK:** I stilling OFF er apparatet stadig forbundet med lysnettet Hvis det ønskes fuldstændig afbrudt skal netledningen trækkes ud.

This unit is produced to comply with Directive 82/499/EEC, CISPR Pub. 13 and Pub. 14 and Standard IEC 65.

Video tapes recorded with this video recorder in the LP (Long Play) mode cannot be played back on a single-speed video recorder.

### CAUTION

- When you are not using the HR-D750E for a long period of time, it is recommended that you disconnect the power cord from the AC outlet.
- Dangerous voltage inside. Refer internal servicing to qualified service personnel. To prevent electric shock or fire hazard, remove the power cord from the AC outlet prior to connecting or disconnecting any signal lead or aerial.

- Only cassettes marked "VHS" can be used with this video cassette recorder.
- HQ VHS is compatible with existing VHS equipment.

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## FEATURES

### High-quality pictures

- **HQ (High Quality) System technologies** with DE (Detail Enhancer) and WCL (20 % higher white clip level).
- Picture sharpness control.

### High-quality sound

- **Conforms to the Hi-Fi VHS standard** for superlative stereo sound with a dynamic range of **more than 90 dB.**
- **Hi-Fi audio Long Play mode** for up to 8 hours of continuous Hi-Fi stereo sound recording and playback with a single cassette.
- Advanced switching noise reduction circuit.
- Peak-hold audio level indicators.
- **Audio dubbing facility.**
- Headphone jack with output level control.

### Special-effects playback

- **Double-Azimuth 3-head (DA-3) system** for noiseless stills and frame advance.
- **Variable-speed slow motion** at 1/6, 1/12, 1/18, 1/24 and 1/30 normal speed.
- **Variable-speed search** at 3, 5, and 9 times normal speed in both directions.
- **Double-speed forward playback** and normal-speed reverse playback.

### Tuner features

- **Frequency synthesized wide-band cable tuner** with 48-channel storage capacity.
- **Pretuned to European television broadcast frequencies:** VHF, UHF and cable channels.
- **Sound-Multiplex capability** for recording stereo and bilingual broadcasts. (Designed for use with West Germany's Sound-Multiplex TV system only.)
- **10-Key random-access channel selection** and up/down scanning.

### Timer features

- **Compatible with VPS (Video Programme System)** through use of an optionally available VPS adapter, and capable of **Teletext Programming** through use of an optional VPV adapter.
- **1-Year/8-event 10-key programmable timer.**
- **Remote programming by data transfer.**
- **Direct VCR timer programming.**
- Instant timer recording.

### Remote control features

- **Independent timer programming with built-in LCD and 4 programme memories.**
- **10-Digit keypad for timer programming,** channel selection, Index Search and Go-To functions.
- **TV control** for power on/off, volume, channel and AV mode selection (Designated JVC TVs only).

### Tape access features

- **VHS Index Search System** which automatically places index codes at the beginning of any recording, with mark/erase facilities for manual marking of extra index codes during recording and playback, and manual erasing of unnecessary index codes during playback.
- **Automatic location** of up to 9 coded programmes by remote-specifying the number of index codes to be skipped. A specified code can be detected in the Shuttle Search, or the faster REW and FF modes for automatic playback.
- **Intro search** to play back the beginning of each indexed programme for about 5 seconds in fast-motion.
- **Realtime go-to function for locating a point on tape a** specified time away from the beginning.
- **Realtime search function for locating a point on tape a** specified time away from the current position in either direction.
- **Half-loading mechanism for quick tape access:** Index and Intro Search, and Realtime Go-to and Search can all be carried out in the REW and FF modes at up to 60 times normal speed as well as in the Shuttle Search mode.
- Counter memory function for returning to a designated point on tape.
- Shuttle Search with lock function at 9 times normal speed.

### Other value features

- **Realtime tape counter** showing tape time in hours, minutes and seconds by counting the recorded 25-Hz control signal pulses.
- **Automatic backspace editing by Zero Frame Editing system** for clean assemble edits.
- **Automatic functions** including Auto Play, Next-Function Memory, and more.
- **On-screen record-pause mode display** which signals elapsed pause time.
- Electronic tracking controls.
- Comprehensive fluorescent display.
- Switchable AC outlet.

**(58) VIDEO CANCEL button**
Press to cancel the programmed data held in the recorder's timer memory.

**(59) TV PROG./CURSOR ( ∨ / ∧ ) buttons**
Press either button to scan to a desired channel. These buttons can also be used as cursor keys when timer programming with numeric keys.

**(60) INDEX button**
Press to engage the Index Search mode. (See page 19.)

**(61) GO-TO button**
Press to engage the Realtime Go-To or Realtime Search mode. (See page 20.)

**(62) SP/Hi-Fi LP button**

**(63) INTRO button**
Press to engage the Intro Search mode. (See page 21.)

**(64) VARIABLE SEARCH buttons**

**(65) Rewind/Fast-forward (Shuttle Search) buttons ( ◄◄ / ►► )**

**(66) Record button ( ● )**
Press this button together with the ►/X2 button to start recording.

**(67) Play/X2 button ( ►/X2)**

**(68) Pause/Still button ( ❚❚ )**

**(69) Stop button ( ■ )**

**Note:**
Several buttons on the remote control unit will have additional functions (as suggested by additional labels) when the optional VU-V120E VPV adapter or VU-V100E VPS/VPV adapter is connected. For those functions refer to the instruction manual of the VPV adapter.

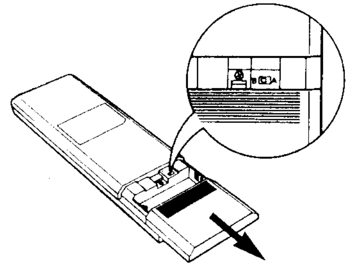
### Remote Control Unit

**A/B mode switching**
A switch on the back of the remote control labelled A/B is accessible when the battery compartment cover is removed.
- This switch is preset to the "A" position. Do not touch it unless you use two JVC video decks side by side.
- When you place two JVC video decks near each other, use this remote control in the "B" mode to prevent both decks from responding simultaneously to this remote control's signals. For this purpose, carefully follow the instructions below:
  (1) Unplug the power cord of the HR-D750E from the AC outlet.
  (2) Set the remote control unit's A/B mode switch to "B".
  (3) Plug the power cord of the HR-D750E into the AC outlet.
  (4) Turn on the power of the HR-D750E using the remote control's OPERATE VIDEO button.
    - The HR-D750E "memorises" this B code and then will respond only to the signals of this remote control unit. The deck will respond only to its remote control.

    **Note:**
    Do not operate other remote controls after you have plugged the HR-D750E into the AC outlet and before you press the OPERATE VIDEO button of this remote control.

**Operating distance for remote control unit**
- The maximum operating distance is about 8 m.

**Installing the batteries**
- Insert two "R6"-size batteries (provided) into the battery compartment on the rear of the remote control unit, observing correct polarity.



### Rear Panel

**(70) AC outlet (SWITCHED)**
Connect the power cord of other audio or video equipment (such as an FM tuner) requiring less than 2 amperes of power.
This outlet is controlled by the AC ONLINE switch ㊲
When the AC ONLINE switch is set to OFF, this outlet supplies (220∿, 50/60 Hz) regardless of the OPERATE button setting as long as the power cord of the HR-D750E is plugged in.
When the AC ONLINE switch is set to ON this outlet supplies power only when the recorder is on.

**(71) AUDIO/VIDEO socket**
A 21-pin standardised audio/video input/output socket for the connection to a TV or a 2nd video recorder equipped with the same type of socket. The input from this socket can be recorded in the AUX mode engaged by obtaining "AU" in the channel display.

**(72) VPS/VPV connector**
Connect the optional VU-V110E VPS adapter; Connect the optional VU-V120E VPV adapter or VU-V100E VPS/VPV adapter for decoding teletext programmes and for teletext timer programming (See page 23.)

**(73) ANTENNA IN connector**
Connect an aerial to this connector.

**(74) Attenuator switch (ATT.)**
Set to OFF to receive broadcasts from distant stations.
Set to ON to receive broadcasts of high field strength.

**(75) TEST signal switch**
Set to ON when tuning your TV receiver for the video channel. A test signal in the form of two vertical white bars will be available.

**(76) V. LOCK adjustment screw**
When operating in the Still mode, adjust this screw to eliminate any vertical vibration of the picture, by using a screwdriver.

**(77) RF converter frequency adjustment screw (CH40 – CH32)**
(See page 8.)

**(78) RF OUT connector**
Connect to the aerial terminal of a TV receiver through the aerial cable (provided).

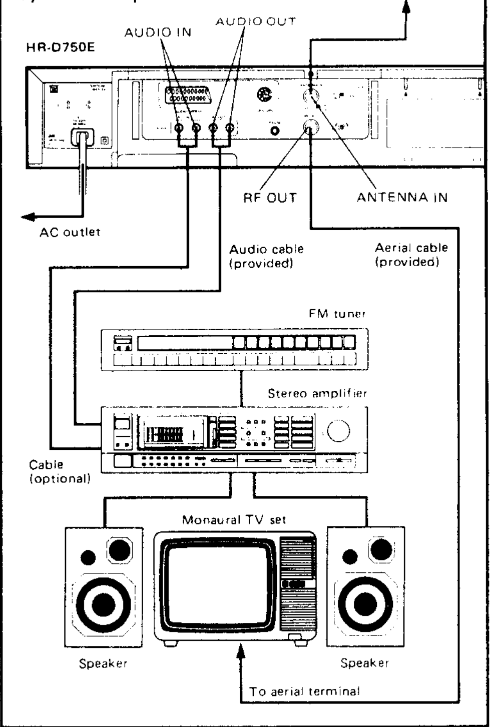
**(79) PAUSE terminal**
When using a JVC video camera, connect the remote control cable of the camera adapter to this terminal for the purpose of controlling the starting and stopping of the tape with the camera's start/stop switch. When used with a JVC VideoMovie equipped with the Master Edit Control system, this terminal makes quality editing simple.

**(80) AUDIO OUT connectors**
Both hi-fi and normal audio signals can be obtained from these connectors. The output can be selected with the AUDIO MONITOR button ㉛ and Hi-Fi/NORM/MIX button ㉟.

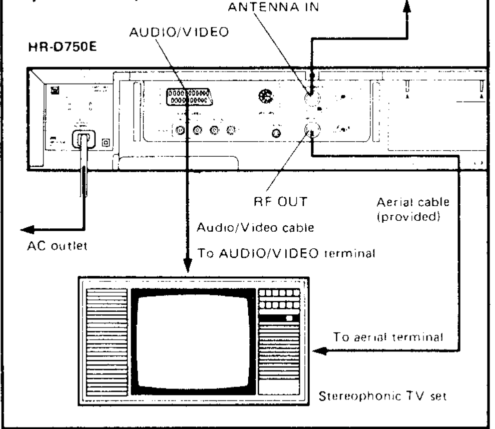
**(81) AUDIO IN connectors**
Connect an audio tape recorder or other audio sources for recording sound.

**(82) Power cord.**

System Example 1



System Example 2



**Procedure**
1. Remove the aerial cable from the TV receiver and reconnect to the HR-D750E.
2. Connect the HR-D750E to the TV receiver using the aerial cable (provided).
3. Connect the AUDIO IN L and R (81) connectors of the HR-D750E to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)
4. Connect the AUDIO OUT L and R (80) connectors of the HR-D750E to the AUX IN or TAPE MONITOR terminals of the amplifier.

**Notes:**
- Observe L and R when connecting the audio input and output connectors of the HR-D750E to a stereo amplifier.
- If stereo or bilingual TV broadcasts are receivable in your area, this recorder can record them independently of the TV set and play them back through the connected audio system.
- When listening to sound from the connected stereo system, turn down completely the sound volume of the TV receiver.
- Listening to stereophonic sound is also possible using stereo headphones connected to the front panel PHONES jack ㉓.
- With this setup, you can enjoy prerecorded Hi-Fi VHS video tapes in hi-fi stereo while viewing them on a regular TV receiver, and also you can record FM simulcast television programmes with hi-fi audio accompaniment. **See page 16.**
- If you want to timer-control the recording of FM simulcast programmes, connect the tuner's power cord to the HR-D750E's AC outlet. Set the AC ONLINE switch ㊲ to ON, and both the tuner and the HR-D750E will be switched on at a time preprogrammed by the HR-D750E. Timer-controlled recording of FM simulcast programmes is not possible with the type of tuners which reset the channel each time the power is switched off.

### For customers who own a stereo TV equipped with a standardised audio/video socket

By connecting the 21-pin AUDIO/VIDEO socket (71) of the HR-D750E to your TV's audio/video socket, it is possible to play stereo tapes through the TV's speakers. In this case, use the A/V mode specified on your TV, instead of UHF channel 36.

**CAUTION**
- The HR-D750E has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

# CONTROLS, INDICATORS AND CONNECTORS

Refer to the diagrams on the front foldout page.

## Front Panel

① **OPERATE button with green indicator**
Press to apply operating power to the recorder. The indicator will light. Loading a cassette also turns the power on.

② **Cassette EJECT button**

③ **Infrared beam receiving window**

④ **REW and FF (SHUTTLE SEARCH) buttons**
Press while in the Stop mode to rewind or fast-forward the tape; press while in the Play mode to view the speeded-up picture for programme search. (See pages 13 and 19.)

⑤ **PLAY/X2 button**
Press once to play back the tape; press again for double-speed playback. Also press this button to cancel the Pause/Still, Slow and Search modes.

⑥ **AUDIO DUB button**
Press while in the Still mode, then the PLAY/X2 button for audio dubbing.

⑦ **Cassette loading slot**
Insert a VHS cassette. The door will close and the "cassette loaded" indicator will appear on the FDP (fluorescent display panel).

⑧ **MARK button**
Press during playback or recording to put an index code onto the tape. (See page 19.)

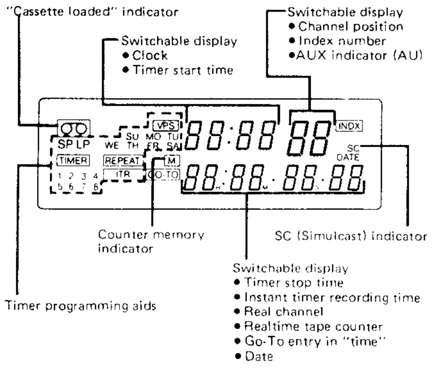
⑨ **ERASE button**
Press during playback to erase an index code. (See page 19.)

⑩ **Mode indicators**

| | |
|---|---|
| PLAY/X2: | Lights in the Play or Double-Speed Play mode. Also lights in the Record mode together with the REC indicator. |
| PAUSE: | Lights in the Still or Record-Pause mode. |
| REC: | Lights in the Record mode together with the PLAY/X2 indicator. |
| AUDIO DUB: | Lights in the Audio Dubbing mode. |

⑪ **Audio Level indicators**
Show the level of audio signal being recorded or played back.

⑫ **Fluorescent display panel**
Fully explained in relevant sections.



⑬ **CH (–/+) BACK/NEXT buttons**
Press either button to scan to a desired channel. These buttons can also be used as cursor keys for 10-key programming.

⑭ **COUNTER RESET button**
Press to reset the tape counter reading to "0H 00M 00S".

⑮ **VPS/CH button**
Allows for VPS programming when pressed in the Timer Set mode. In all other modes, this button functions to engage the tuner in the Real-channel mode. (See pages 9, 10 and 22.)

⑯ **Multi-purpose numeric keys**

| | |
|---|---|
| Channel selection: | See page 9. |
| Clock setting: | See page 8. |
| Timer programming: | See pages 17 and 22. |
| Counter Go-To: | See page 20. |
| Index Search: | See page 19. |
| External source recording: | See page 24. |

⑰ **LED indicators**

| | |
|---|---|
| L & R: | Light when Hi-Fi stereo audio is selected with the AUDIO MONITOR button ㉛. |
| NORMAL: | Lights when normal audio is selected with the Hi-Fi/NORM/MIX button ㉟. |
| L: | Lights when Left Hi-Fi audio soundtrack is selected with the AUDIO MONITOR button ㉛. |
| R: | Lights when Right Hi-Fi audio soundtrack is selected with the AUDIO MONITOR button ㉛. |
| MARK: | Lights when an index code is being recorded by pressing the MARK button ⑧. |
| ERASE: | Lights when an index code is being erased by pressing the ERASE button ⑨. |
| STEREO: | Lights when a stereo programme is being received. |
| BILINGUAL: | Lights when a bilingual programme is being received. |

⑱ **REC/ITR button**
Press once for normal recording; press again for Instant Timer Recording; each subsequent pressing adds 30 minutes to the recording time, up to a maximum of 4 hours. (See page 15.)

⑲ **PAUSE/STILL button**
Press to stop the tape temporarily to avoid recording of unwanted material or to view a still picture. The still picture can be advanced step by step.

⑳ **VARIABLE SEARCH buttons**
To control the search speed, both slow-motion and fast-motion search are available. The slow-motion speed can be changed in 5 steps: 1/6, 1/12, 1/18, 1/24 and 1/30 normal speed. For fast-motion search, available speeds are x3, x5, and x9 in both directions and x2 in the forward direction. Normal speed in the reverse direction is also possible. No audio is available in the Variable Search mode. To cancel the Variable Search mode, press the PLAY/X2 button. (See page 14.)

㉑ **STOP button**
Press to stop the tape.

㉒ **Phones LEVEL control**
Adjusts the level of audio output from the headphone jack.

㉓ **Headphone jack (PHONES)**

㉔ **MIC IN jack**

㉕ **PICTURE SHARPNESS control**
Turn this knob clockwise to make the picture sharper. Turn counterclockwise to give the picture a softer tone. Effective only for playback pictures. (No effect on recording.)

㉖ **TRACKING (–, +) controls**
If noise bars are seen during playback (normal or slow), use these buttons to reduce them. The tracking is reset to standard when both buttons are pressed together, the cassette ejected, or the power turned off.

㉗ **DISPLAY button**
Press to change the recorder's FDP from the Timer Programming mode to the Clock mode.

㉘ **COUNTER MEMORY button**
When this button is pressed to ON; M will appear on the FDP and the tape will stop automatically at the counter reading of about "0H 00M 00S" in the Rewind or Fast Forward mode.

㉙ **CH SEARCH button**
Press to initiate automatic scan tuning in the Real-channel mode. (See pages 9 and 10.)

㉚ **FINE (–, +) buttons**
To fine-tune in to a certain station by shifting the frequency in either direction. (See page 10.)

㉛ **AUDIO MONITOR button**
Press to select the audio output. Each time the button is pressed, the soundtrack to be output changes: left and right (stereo), left or right. These are indicated by the L and R indicators ⑰. (See page 12.)

㉜ **STORE button**
Press to store necessary channels. (See page 10.)

㉝ **SC button (Simulcast)**
When recording FM simulcast TV programmes, press this button (anytime, except when in the AUX mode) to set to the simulcast mode. "SC" will light on the FDP, and the video from the built-in tuner and the hi-fi audio signal from the rear panel AUDIO IN connectors will be recorded. (See page 16.)

㉞ **SP/Hi-Fi LP button**
Normally set this button to the SP (Standard Play) mode ("SP" lights on the FDP) when recording. In the SP mode, both pictures and sound are recorded, allowing up to 4 hours of continuous recording with a single cassette (E-240).
When using the HR-D750E as an audio deck, you can use the LP (Long Play) mode by pressing this button to obtain the LP indication on the FDP. In this mode, Hi-Fi audio recording is possible for up to 8 hours with a single cassette (E-240).

㉟ **Hi-Fi/NORM/MIX button**
Press to select for listening among either hi-fi or normal soundtracks or a mixture of the two.

㊱ **CLOCK ADJUST button**
Press to adjust the clock.

㊲ **AC ONLINE switch**

| | |
|---|---|
| OFF position: | Power is available from the rear panel AC outlet regardless of whether the recorder is on or off. |
| ON position: | Power is available from the rear panel AC outlet only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment. |

㊳ **PROG button**
Press to programme the timer.

㊴ **TUNER SOUND SELECT switch**
MAIN: To record the main soundtrack (local language).
SUB: To record the sub soundtrack (foreign language).
(See pages 11 and 16.)

㊵ **CANCEL/SKIP button**
A dual-purpose button. Use to clear the programmed data in the Timer Programming mode or skip unnecessary channels in the Channel Set mode. (See pages 10 and 18.)

㊶ **TIMER button**
Press to engage the Timer Recording Standby mode.

## Infrared remote control unit

The infrared remote control unit gives you full operation control from your viewing position.
Note: The numeric keys on the remote control do not function for clock setting.

㊷ **OPERATE (VIDEO) button**
Press to turn the recorder power on or off.

### TV OPERATION buttons (Designated TV models only.)

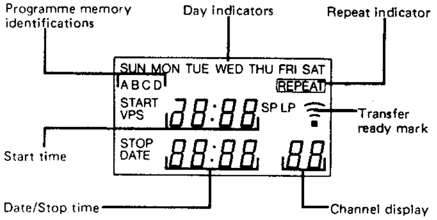
㊸ **MONITOR TV/VIDEO button**
Press to select the TV's operating mode: TV for viewing broadcast programmes or tape programmes via RF OUT connection, and VIDEO for viewing programmes via AV connection.

㊹ **OPERATE (TV) button**
Press to turn the TV power on or off.

㊺ **TV VOL. -/+ buttons**
Press either button to adjust the TV's sound volume.

㊻ **TV CH -/+ buttons**
Press to select a desired channel of the TV receiver.

㊼ **LCD (Liquid Crystal Display) panel**
Refer to this panel when programming the remote control's built-in timer memory.



㊽ **AUDIO MONITOR button**
Press to select the audio output. (See page 12.)

㊾ **DISPLAY button**
Press to change the recorder's FDP display from the Timer Programming mode to the Clock mode.

㊿ **MENU/TEXT button**
Refer to page 23.

(51) **CANCEL button**
Press to cancel the programmed data in the remote control's timer memory.

(52) **PROGRAM button**
Press to programme the remote control's timer memory.

(53) **TRANS button**
Press to transfer the data held in the remote control's timer memory to the recorder.

(54) **TIMER button**
Press to engage the Timer Standby mode.

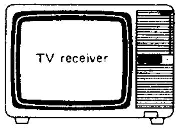
(55) **Multi-purpose numeric keys**

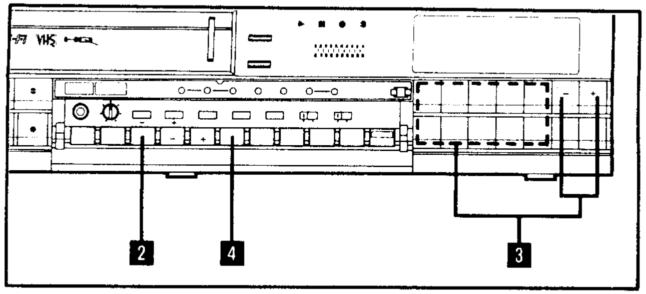
(56) **VPS/CH button**

(57) **VIDEO PROGRAM button**
Press to call up the recorder's timer memory.

## Storing channels

Turn the TV receiver to ON and adjust it to your video channel.

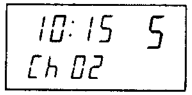




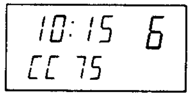
**A. Automatic setting**

**1** Turn the power on.
- The display will change from the Date mode to the Counter mode.

**2** Press the CH SEARCH button ㉙ .
- The display will change to the Real Channel mode and automatic scanning will take place for "Ch" channels, then for "CC" channels.
- Reverse search will be engaged if the CH SEARCH button is kept depressed.

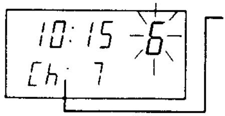


VHF channel 2 is stored for channel position 5.



Cable channel 75 is stored for channel position 6.

- When a broadcast is detected, scanning stops automatically and the displayed channel position number will blink.



"Colon" will appear to indicate that this real channel is not stored for the indicated channel position.

**3** Select a channel position into which you wish to store that station by using the numeric keys ⑯ or the CH (–/+). buttons ⑬ while the channel position number is blinking.

**4** After confirming the real channel number and channel position number, press the STORE button ㉜ until the channel position number stops blinking.
- "Colon" will disappear and the selected station has been stored.

**B. Manual Setting from remote control unit**

(1) Press the VPS/CH button.
- The display will change to the Real channel mode.

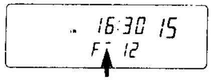
(2) Press the VPS/CH button until the real channel number starts blinking.
- Pressing the VPS/CH button will alternate the real channel mode between Ch and CC.
- Blinking will stop in 10 seconds.

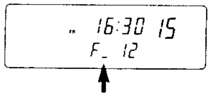
(3) Enter the number of a real channel to be preset.
- The channel position number will start blinking.

(4) Select a channel position into which the selected real channel is to be stored, using the 10-digit keypad.
- Always key in a two-digit number ("05" for channel position 5 for example) and depress the numeric key for the second digit continuously until blinking stops. This enables the entered number to be stored.
- The display will return to the clock mode by simply keying in the channel number to be viewed.

**● Fine Tuning**

For fine tuning, use the FINE "+" or "-" button in step 3 (both in automatic and manual setting) "+" to fine-tune in the direction of increasing frequencies, and "-" to fine-tune in the direction of decreasing frequencies.





### Skipping the stored channels

1. Call up the channel position number that you wish to skip by using the CH (-/+) buttons or 10 numeric keys.
2. Press the VPS/CH button.
3. Press the CANCEL/SKIP button ㊵ .
   - "Colon" will appear to indicate that the displayed real channel is not stored.
   - The skipped channel position number will not appear on the channel display during up/down scan tuning.

**Note:**

If no command is given after each step of the setting operation, the Real Channel mode will be automatically cancelled in 10 seconds.

# INFORMATION ON THE HR-D750E'S AUDIO SYSTEM

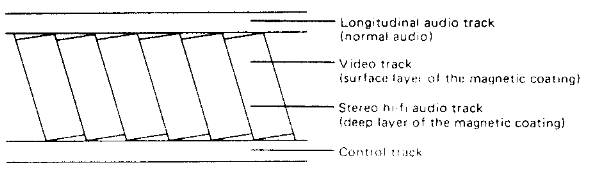
## Hi-Fi and normal audio

To provide true hi-fi audio accompaniment to video entertainment and, at the same time, compatibility with regular VHS tapes, the HR-D750E employs a unique audio recording system. Hi-fi audio signals (2-channel) are recorded deep into the tape's magnetic coating, and the video signal is recorded on top of the audio signals in a shallower layer. At the same time, another audio head records normal audio signals (monaural) onto the usual longitudinal audio track. Since this longitudinal audio track is exactly the same as on regular VHS tapes, tapes recorded on the HR-D750E can be played back on other VHS machines, and vice versa. Also, this longitudinal track can be replaced later with new recordings through audio dubbing.

**CAUTION:**

The hi-fi soundtrack recorded with the HR-D750E cannot be reproduced with video equipment other than Hi-Fi VHS.

**Tape pattern recorded with the HR-D750E**



Hi-fi audio recording and reproduction are availabe only from the hi-fi audio track while the longitudinal audio track provides normal audio.

**The hi-fi and normal soundtracks are recorded simultaneously,** and audio dubbing is applicable only to the normal audio.

### Recording options according to the selected input mode

| Input mode / Track | Video track | Normal audio track (mono) | Hi-fi audio track (2-channel) |
|---|---|---|---|
| TUNER<br>SC ☐<br>(button pressed to OFF) | TV picture (from built-in tuner) | TV sound (from built-in tuner) | **TV sound (from built-in tuner) (Mixing with microphone input is possible)** |
| SC<br>SC ☐<br>(button pressed to ON) | TV picture (from built-in tuner) | TV sound (from built-in tuner) | Audio signal from AUDIO IN (Mixing with microphone input is possible.) |
| AUX<br>AU<br>Channel display section | Video signal from AUDIO/VIDEO | Audio signal from AUDIO/VIDEO (Mixing with microphone input is possible.) | |

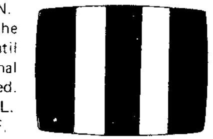
Notes:
- To engage the AUX mode, press the "0" key of the 10-digit keypad.
- Microphone input will always be mixed with the audio signals on the hi-fi audio track. Therefore, do not leave a microphone connected to the MIC IN jack unless needed.
- You can record audio only (without recording any video signal) in either the SP or Hi-Fi LP mode. In the Hi-Fi LP mode you can enjoy up to 8 hours of hi-fi stereo recording with a single cassette (E-240).

### Recording options according to the type of broadcasts and the setting of the TUNER SOUND SELECT switch

| Type of broadcast / TUNER SOUND SELECT switch position / Audio Track | | Normal audio track (mono) | Hi-fi audio track (2-channel) | |
|---|---|---|---|---|
| | | | L | R |
| Regular (monaural audio) | Either position | Mono | Mono | Mono |
| Stereo broadcast | Either position | L + R mixed | Stereo | |
| Bilingual broadcast | MAIN | Main soundtrack (local language) | Main soundtrack (local language) | Sub soundtrack (foreign language) |
| | SUB | Sub soundtrack (foreign language) | | |

# VIDEO CHANNEL SETTING

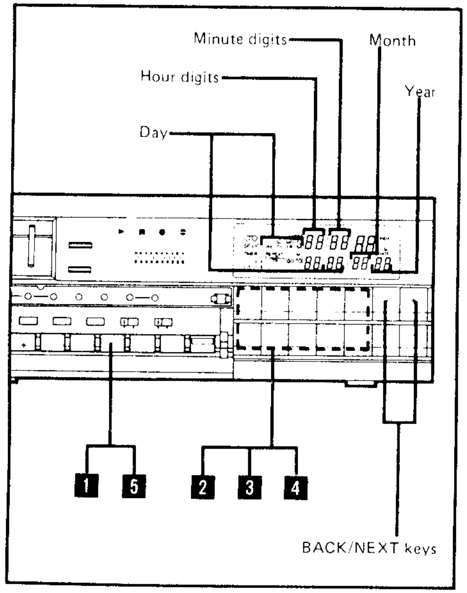
1. Press the OPERATE button ❶ to turn the power on. Turn on the TV receiver.
2. Set the TEST switch (75) to ON.
3. Adjust your TV receiver in the vicinity of UHF channel 36 until you bring in the two white signal bars on the screen as illustrated. This is your VIDEO CHANNEL.
4. Reset the TEST switch to OFF.



**Notes:**
- ●If some interference noise is seen on the screen because of broadcasts on neighbouring channels or if your preset broadcasts should be affected in picture quality, it is necessary to shift the RF converter output frequency from that of channel 36. Consult your JVC dealer for making this adjustment.
- ●Video channel setting is also possible using a prerecorded VHS video cassette. Play back the tape and tune the TV receiver to obtain clear pictures and sound while monitoring the playback picture on the TV screen.
- ●If your TV receiver is not provided with an AFC circuit, perform fine tuning of the TV receiver when you are actually viewing video cassettes.

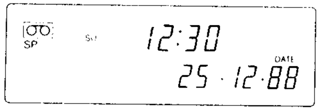
# CLOCK SETTING

Plug the HR-D750E into an AC outlet. The display shows a blinking 0:00.



**Power failure indicator**
The blinking 0:00 (initial condition of the display) is also a power failure indicator, showing that there has been a power failure exceeding about 3 to 5 minutes. Re-adjusting the time restores the normal condition of the clock display.

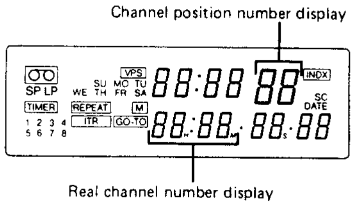
1. Press CLOCK ADJUST ㊱ .
   The display will change to the Clock Set mode with the hour indication blinking.
2. Set the hour and minute in that order.
   - ●The blinking position is ready for entry.
   - ●To set a one-digit number, first press "0", then press the numeric key for 1 to 9.
   - ●Zero will not be displayed in the tens place of the hour indication unless the cursor is moved back to the hour digits.
   - ●For a two-digit number, simply press the corresponding numeric keys in the right order.
   - ●In hour setting, numbers larger than 23 will be rejected.
   - ●In minute setting, numbers larger than 59 will be rejected.
3. Set the day and month in that order.
   - ●The setting method is the same as for time setting.
   - ●In day setting, invalid numbers such as 32 of January or 30 of February will be rejected.
   - ●29 or February will be accepted only during leap years.
   - ●In month setting, numbers larger than 12 will be rejected.
4. Set the year.
   - ●Key in only the last two digits of the year.
5. Press CLOCK ADJUST.
   - ●Press it at the exact instant of the time signal, and the clock will be set accurately to the present time.



Notes:
- ●If you press a wrong numeric key, you can return to the previous position using the BACK "-" key.
- ●Once all necessary data have been entered, you can reach any position for correction using the BACK/NEXT "-" and "+" keys.
- ●Clock setting is not possible if the TIMER button ㊶ is engaged with the TIMER indicator lit. First check to see that the TIMER indicator is off.

# OPERATING THE BUILT-IN TUNER

The HR-D750E incorporates an advanced frequency synthesized tuner which is pretuned to 112 channels to cover VHF, UHF and CATV broadcasts. Channel indication is given in two different ways: real channel numbers and channel position numbers. Real channel number indication is available by pressing the VPS/CH button ⓯ or during search by pressing the CH SEARCH button ㉙ , while channel position number indication is always available in the channel display.



**Correspondence between 112 pretuned TV stations and the HR-D750E's real channel indications**

| DISPLAY | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ch | – | E2 | E3 | E4 | E5 | E6 | E7 | E8 | E9 | E10 | E11 | E12 | A | B | C | D | E | F | G | H |
| CC | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | S13 | E14 | E15 | S16 | S17 | S18 | S19 | S20 |
|  | M1 | M2 | M3 | M4 | M5 | M6 | M7 | M8 | M9 | M10 | U1 | U2 | U3 | U4 | U5 | U6 | U7 | U8 | U9 | U10 |
|  | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 |
| **DISPLAY** | **21** | **22** | **23** | **24** | **25** | **26** | **27** | **28** | **29** | **30** | **31** | **32** | **33** | **34** | **35** | **36** | **37** | **38** | **39** | **40** |
| Ch | E21 | E22 | E23 | E24 | E25 | E26 | E27 | E28 | E29 | E30 | E31 | E32 | E33 | E34 | E35 | E36 | E37 | E38 | E39 | E40 |
| CC | S21 | S22 | S23 | S24 | S25 | S26 | S27 | S28 | S29 | S30 | S31 | S32 | S33 | S34 | E35 | E36 | E37 | E38 | E39 | E40 |
| **DISPLAY** | **41** | **42** | **43** | **44** | **45** | **46** | **47** | **48** | **49** | **50** | **51** | **52** | **53** | **54** | **55** | **56** | **57** | **58** | **59** | **60** |
| Ch | E41 | E42 | E43 | E44 | E45 | E46 | E47 | E48 | E49 | E50 | E51 | E52 | E53 | E54 | E55 | E56 | E57 | E58 | E59 | E60 |
| CC | S41 | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – | – |
| **DISPLAY** | **61** | **62** | **63** | **64** | **65** | **66** | **67** | **68** | **69** |  |  | **75** | **76** | **77** |  |  |  |  |  |  |
| Ch | E61 | E62 | E63 | E64 | E65 | E66 | E67 | E68 | E69 |  |  | – | – | – |  |  |  |  |  |  |
| CC | – | – | – | – | – | – | – | – | – |  |  | X | Y | Z |  |  |  |  |  |  |

**Stored channels**
A total of 112 channels are receivable. Of them, up to 48 can be stored for easy channel selection. Prior to shipment, some channels are stored.

It is possible to store more channels or skip some channels if there are no broadcasts on those channels in your area. It is possible to change the stored channels to correspond to your preferred channel allocation. Skipped channels can be restored whenever necessary.

- ●Channel memories are permanent; the programmed channel allocation will not be erased even if the recorder is unplugged from the AC outlet.

**Channel selection**
To select a channel for recording, normally use the CH (–/+). buttons ⓭ (TV PROG. (59) on the remote control) or 10 numeric keys ⓰ (55) . You can choose any channel from among the stored ones by calling up the corresponding channel position number.

- ●Use the CH "–" button to scan to a channel in the direction of decreasing numbers; the CH "+" button, in the direction of increasing numbers.
- ●When using the 10 numeric keys, pay attention to the following: To set a one-digit number, first key in 0. To key in a two-digit number, enter numbers in sequence. The number entered first will be shifted to the tens place. An invalid number larger than 48 will be rejected.

If you want to select a channel other than those stored, engage the Real Channel mode and call up a channel, while referring to the real channel number display.
With recorder's controls:
- ●Press the VPS/CH button ⓯ to engage the Real Channel mode and call up a channel by using the 10 numeric keys. Or simply press the CH SEARCH button ㉙ .

With remote control:
- ●Press the VPS/CH button (58) to engage the Real Channel mode and call up a channel by using the 10 numeric keys.
  For details, refer to next page.

## SPECIAL-EFFECTS PLAYBACK

**DOUBLE-SPEED PLAYBACK**

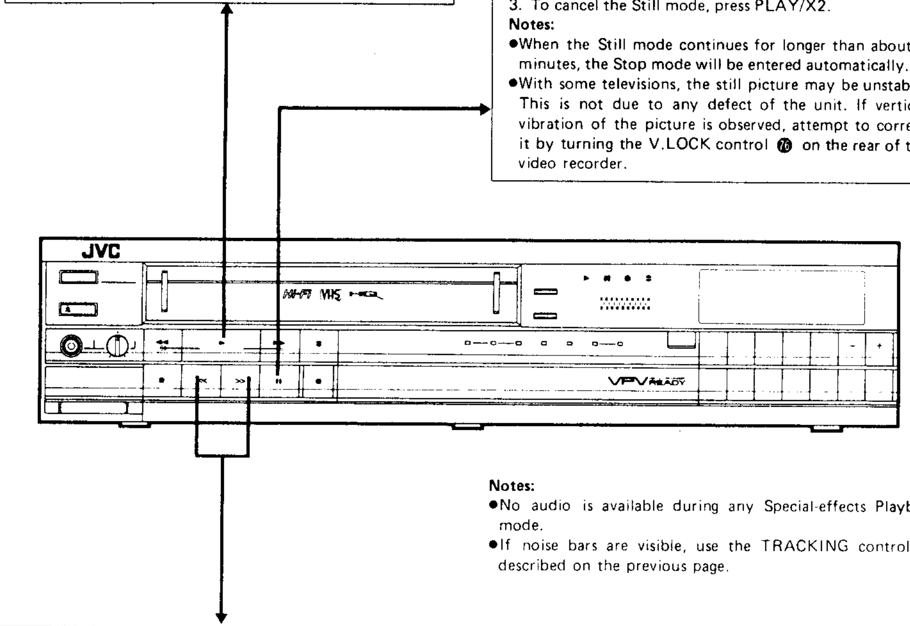
- ●Press PLAY/X2 ⑤ while in the Play mode; double-speed playback will be engaged.
- ●To resume normal playback, press the same button again.

**STILL PICTURE**

1. Press PAUSE/STILL ⑲ during playback.
2. To advance the still picture, press PAUSE/STILL a number of times.
3. To cancel the Still mode, press PLAY/X2.

**Notes:**

- ●When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- ●With some televisions, the still picture may be unstable. This is not due to any defect of the unit. If vertical vibration of the picture is observed, attempt to correct it by turning the V.LOCK control (76) on the rear of the video recorder.



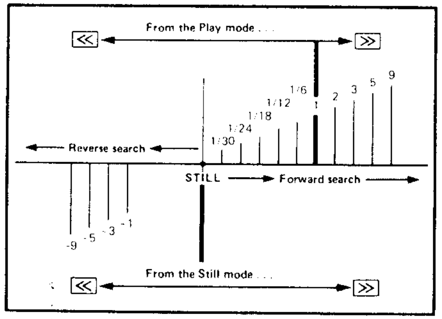
**Notes:**

- ●No audio is available during any Special-effects Playback mode.
- ●If noise bars are visible, use the TRACKING controls as described on the previous page.

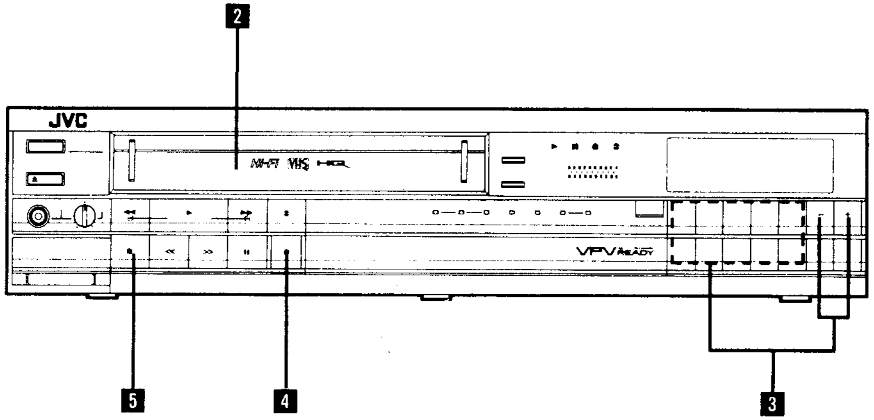
**VARIABLE SEARCH** ([≪] and [≫])

Variable speed search is possible in either forward or reverse direction from either the Still or Play mode.

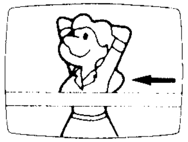
- ●To search in the forward direction:
  - ●Press the [≫] button in the Play mode to start fast-motion searching from 2 times normal speed. To increase speed (to 3, 5, 9 times normal), press [≫] repeatedly.
  - ●Press the [≫] button in the Still mode to start slow-motion searching from 1/30 normal speed. To increase speed (to 1/24, 1/18, 1/12, 1/6, normal, X2, X3, X5, X9), press [≫] repeatedly. To decrease speed, press [≪] repeatedly. (Pressing the [≪] button in the Play mode, starts slow-motion searching at 1/6 normal speed.)
- ●To search in the reverse direction:
  - ●Press the [≪] button in the Still mode to start searching in the reverse direction at the same speed as normal speed playback. To increase speed (to -3, -5, -9 times normal), press [≪] repeatedly. To decrease speed, press [≫] repeatedly.
- ●To return to the normal Play mode, press the PLAY/X2 button.



## BASIC OPERATION FOR RECORDING TV PROGRAMMES



1. Turn the TV receiver on and adjust it to your video channel.
2. Load a cassette (with safety tab in place).
   - ●Power will be switched on automatically.
3. Press either CH (–/+) ⑬ or the numeric keys ⑯ to select the channel you wish to record.
4. Press REC/ITR ⑱ to start recording.
   - ●Be careful to press REC/ITR only once, or Instant Timer Recording will begin.
   - ●Press ● (66) and ►/X2 (67) simultaneously when using the remote control unit.
   - ●If there is part of the programme you don't want to record, press PAUSE/STILL ⑲. A white horizontal bar will appear on the screen, which reduces in size in 4 steps as time elapses. When the last quarter starts blinking and disappears, the Stop mode will be entered automatically. The pause duration is possible for about 5 minutes.



**Pause mode indicator**

   - ●To continue recording from the Pause mode, press PLAY/X2 ⑤ while the white bar is on-screen.
5. Press STOP ㉑ at the end of the programme.
   - ●When the end of the tape is reached during recording, the tape is automatically rewound and stops.

Note:

- ●The selected channel cannot be altered during recording. If you wish to change the channel, first engage the Pause mode and then select a different channel.

**INSTANT RECORDING**

If you wish for recording to stop automatically after a certain period of time, use this Instant Timer Recording mode.

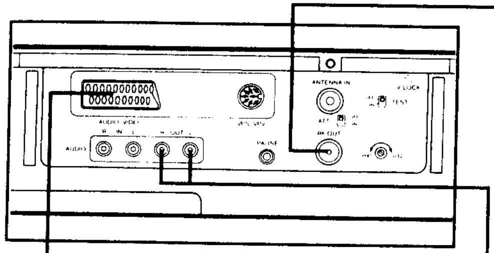
1. Press REC/ITR during recording (or twice if in the Stop mode).
   - ●Recording will begin and the FDP shows "ITR 0:30", indicating that recording will automatically stop and power will switch off after 30 minutes.

SP
12:30 12
ITR
1:00

2. Adjust the switch-off time, if necessary.
   - ●Press REC/ITR to increase the time in 30-minute increments (possible up to 4 hours).
   - ●Use the numeric keys to set to a more precise time when required (possible up to 8 hours 59 minutes). Always key in a full number including hours and minutes. For "0:35", key in zero first. After setting the time, press REC/ITR immediately.

### Dual-audio playback flexibility

Two different types of audio tracks (hi-fi and normal) allow a variety of playback options depending on the connection and the settings of relevant controls and switches.



**RF OUT connector**
Delivers audio (both hi-fi and normal) and video signals to a TV receiver. When the recorder is not used, the aerial signal is supplied from this connector to the TV receiver to allow regular TV viewing; when a video tape is played back through the RF OUT connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed or the one selected by the AUDIO MONITOR button is reproduced. Therefore, for stereo playback, connect a stereo system to the AUDIO OUT connectors or a stereo television to the AUDIO/VIDEO socket. Refer to page 7.

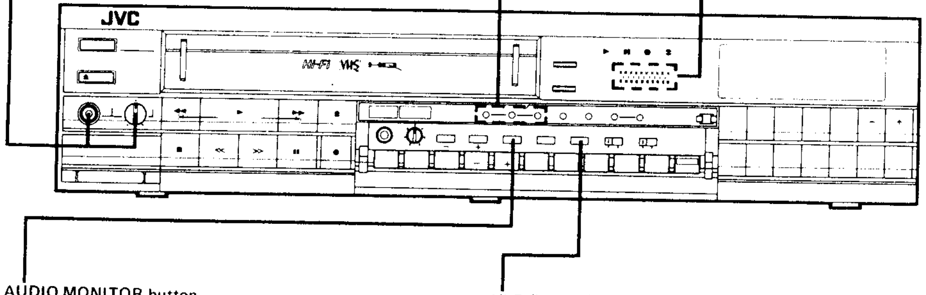
**AUDIO/VIDEO socket**
Delivers audio (both hi-fi and normal) and video signals. (Also accepts audio and video signals for recording from other video equipment.)

**AUDIO OUT connectors**
Delivers the audio signals from both hi-fi and normal audio tracks.

**PHONES jack and LEVEL control**
Delivers the audio signals from both hi-fi and normal audio tracks. The headphone output level is adjustable with the LEVEL control.

**Audio monitor indicators (L, R, NORMAL)**

**Audio level indicators**



**AUDIO MONITOR button**
Selects the hi-fi audio channel (left, right or both) for listening. Use this button together with the Hi-Fi/NORM/MIX button referring to the three LED indicators (L, R and NORMAL) ⓱.

- When the power is turned on, the L and R indicators light and both hi-fi stereo soundtracks can be listened to. Press this button and only the L indicator lights to listen to only the left hi-fi channel sound.
- Press this button again and only the R indicator lights to listen to only the right hi-fi channel sound.

**Notes:**

- This button functions during recording as well, although it has no effect on the recorded signal.
- With the Hi-Fi/NORM/MIX button pressed for the NORMAL setting, pressing the AUDIO MONITOR button has no effect.

**Hi-Fi/NORM/MIX button**
Operates in conjunction with the AUDIO MONITOR button to select sound tracks for listening.

- When the power is turned on, both hi-fi stereo soundtracks can be listened to. Press this button once to listen to only the normal soundtrack (the NORMAL indicator lights).
- Press this button again to listen to a mixture of hi-fi stereo (L and/or R), and normal soundtracks, by selecting the combination with the AUDIO MONITOR button.

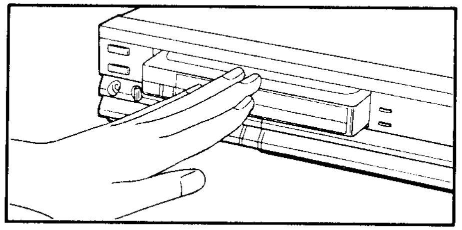
**Notes:**

- This button functions during recording as well, although it has no effect on the recorded signal.
- When playing back a tape containing the same soundtrack on both hi-fi and normal audio tracks, a slight time lag is sensed between the two soundtracks, probably with some distortion when listening in the Mix mode.

## LOADING AND UNLOADING A CASSETTE

### Loading

Insert a cassette as illustrated. Be sure to insert it firmly into the slot; otherwise, it will be automatically ejected



- The automatic loading mechanism will operate only when the cassette is inserted correctly.
- With a cassette inserted, the "cassette loaded" indicator will appear on the FDP.

### Unloading

Press the EJECT button ❷.

**CAUTION**

- If unloading of the cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.
- Do not insert fingers or any foreign object beyond the door of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

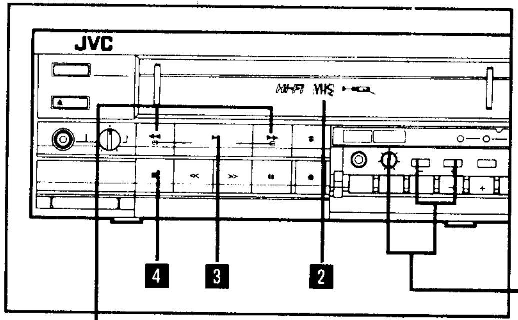
**AUTO POWER-ON AND AUTO PLAY SYSTEM**

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

**POWER-OFF EJECT SYSTEM**

- The cassette can be unloaded even after the power has been turned off. Pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

## PLAYING BACK A VIDEO CASSETTE



1. Turn the TV receiver on and adjust it to your video channel.
2. Load a pre-recorded cassette.
   - Power will be switched on automatically.
   - When the cassette loaded has no safety tab, play back will start automatically.
3. Press PLAY/X2 ❺.
4. Press STOP ㉑ at the end of the programme.
   - The tape will be rewound automatically when its end is reached and the recorder will enter the Stop mode.

**Note:**
Only SP (Standard Play) recordings can be played back.

**SHUTTLE SEARCH**
Shuttle Search allows high-speed playback at 9 times normal speed in either direction.

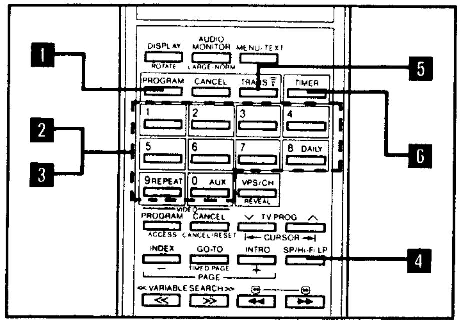
1. Press either REW or FF Shuttle Search ❹ during playback.
2. To cancel the Search mode, press PLAY/X2.
   - For briefer scanning, keep the SHUTTLE SEARCH button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled.

**Picture Sharpness Adjustment**
Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control ㉕ in the corresponding direction.

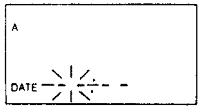
**Tracking Adjustment**
Noise bars may appear on the screen if you play back a tape which was recorded using another recorder. For correction, press either TRACKING button ㉖. Tracking will be reset to the preset standard each time the cassette is ejected.

## C. Independent Remote Programming

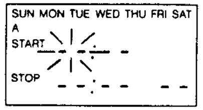
- The remote control incorporates 4 programme memories (A, B, C and D).
- The programmed data is held in memory even after it has been transferred to the recorder.



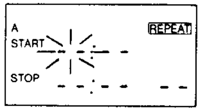
**1** Press PROGRAM (52).
- The LCD will be activated for programme memory "A".
- To advance to programmes B to D, press again.



**2** Enter the date using numeric keys (55).
- Setting for a daily or weekly serial is the same as described in "A. Local Programming".

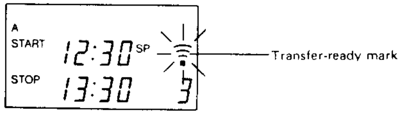


For daily serial setting



For weekly serial setting

**3** When the display changes to the next stage, enter the start time, stop time and channel in succession.
- For programming the timer to record an external source, press the numeric key "0" while the channel is blinking; "0" will appear on the LCD and when transferred in step **5**. "AU" will appear in the channel display section on the FDP.
- After the channel has been entered, the transfer-ready mark will appear and blink.



- When not using the VPS recording system with the VPS adapter connected, press VPS to make "VPS" disappear.
- If the VPS adapter is not connected, the VPS information is not memorized in the recorder even though the VPS indicator is visible on the LCD. Therefore, it is not necessary to turn it off.

**4** Press SP/Hi-Fi LP (62) to obtain the desired recording mode indication on the display.
- The SP or Hi-Fi LP entry can be made anytime while in the Timer Set mode.

**5** Direct the remote control to the recorder's Remote Sensor window ③ and press TRANS (53).
- The programmed data will be loaded in one of the recorder's memories (1 – 8), the vacant one of the smallest programme number.
- If all programme memories are full, the recorder's clock will blink and transmission will not take place.

**6** Press TIMER (54).
- Check to see that the TIMER indicator and other items on the recorder's FDP respond correctly. (See page 17.)

### Setting the date, start and stop times, and channel

- It is not possible to set the date, start and stop times unless the date and clock have previously been set.
- Enter the date while the digits are blinking.
- Unless the start time has been properly set, stop time setting is not possible.
- The stop time can be set within 24 hours from the start time.
- Non-applicable numbers (such as January 32, February 30 for dates, 24 or larger for hours, 60 or larger for minutes and 49 or larger for channels) will be rejected when keyed in.

### Cancelling the preset data

- The preset programmes can be cancelled. First engage the Timer Set mode for the programme number you wish to cancel and then press the CANCEL/SKIP button ㊵ or VIDEO CANCEL ㊽. Or for the remote control's memory, press CANCEL (51).
- Unless the VPS mode is engaged, an executed programme is automatically cleared.

### Checking the programmed data

- Checking and re-programming can be performed anytime, even when the TIMER button has already been engaged.
- While recording is actually taking place according to one preset programme, all other preset programmes can be checked or re-programmed.
- To disengage the Timer Set mode, press the DISPLAY button ㉗ (on the recorder) or the DISPLAY button ㊾ (on the remote control).

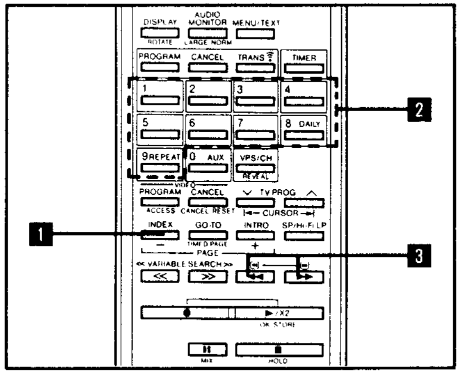
### Timer recording operation

- When the preset start time is reached, recording starts.
- After timer recording, the power is switched off. If the tape end is reached during timer recording, the cassette is automatically ejected and the power is switched off.

**How to use the cursor keys ⑬ (59)**
- If you press a wrong key and the flashing position has advanced, press BACK to return to the previous position for correction.
- Once all data have been programmed, you can reach any position for correction using BACK or NEXT. The flashing position is ready for re-entry.
- Pressing PROG on the recorder or VIDEO PROGRAM on the remote control engages the FDP in the check mode in which no position flashes and data correction is not possible. Pressing PROGRAM on the remote control engages the LCD in the transfer-ready mode in which the transfer-ready mark is flashing and data correction is not possible. For correction of data, press either cursor key to move to the position which requires correction.

The Index Search function gives you automatic access to locations on the tape where index codes are recorded. Index codes are recorded automatically at the beginning of recordings which are started from the Stop or Timer Standby mode, or recorded manually at any other position during recording or playback. Unnecessary codes can be erased manually during playback. In neither case is there any effect on the audio or video recordings on the tape. With the HR-D750E, you can access any one of up to 9 of these indexed segments in either the forward or reverse direction.

### Using the Index Search function



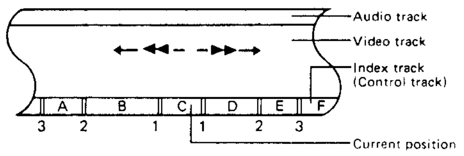
**1** Press INDEX (60) while in the play or Stop mode.
- The channel display of the FDP will change to the Index Search mode and the " INDX " indicator will light.

**2** Specify the index number using one of the numeric keys (55) (1 – 9) within 10 seconds.
- The specified number will appear in the FDP.

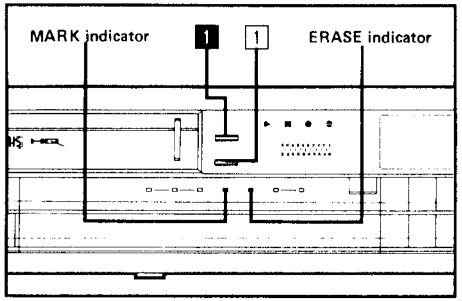
**3** Press either ◀◀ or ▶▶ (65).
- The tape will move and the index numbers count down to 0, where normal playback will start.
- If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the much faster Rewind or Fast-Forward mode.

**Notes:**
- To cancel the Index Search mode before completion, press ▶/X2 (67) or ■ (69).
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

**Tips for specifying the index number**



- "1" + ▶▶ moves playback to the beginning of segment D.
- "1" + ◀◀ moves playback to the beginning of segment C.
- "2" + ◀◀ moves playback to the beginning of segment B.
- If no number is entered, a value of "1" is assumed.



### Marking extra index codes

**1** Press MARK ⑧ while in the Record or Play mode.
- An index code will be recorded on the tape.
- The MARK indicator ⑰ will blink while the index code is being recorded.
- If you wish to add an index codes from the Record-Pause mode, press MARK before pressing PLAY/X2 to resume recording.

### Erasing index codes

☐1 Press ERASE ⑨ while in the Play mode.
- First the Shuttle Search mode will be engaged and, when an index code is detected, it will be erased automatically. Then the Erase mode will be cancelled and playback resumes.
- The ERASE indicator ⑰ remains lit during the searching process and blinks while the code is being erased.

**Notes:**
- Index codes cannot be added or erased on a tape with its safety tab removed.
- While the index code is being searched for in the Erase mode, random noise appears on the screen.
- Audio is muted in both the Mark and the Erase modes.

# OTHER RECORDING POSSIBILITIES

## RECORDING A TV PROGRAMME WHILE WATCHING ANOTHER

A programme not being viewed can be recorded while you enjoy another programme. This permits the recorded programme to be played back later at your convenience.
The recording procedure is exactly the same as described on the previous page. The points to be remembered are:

- ●Select the channel you wish to record with the recorder's channel select buttons.
- ●Select the channel you wish to view with the TV receiver's channel selector.

## RECORDING STEREO TV PROGRAMMES

**(Applicable only to the West German Sound Multiplex TV system)**
If stereo TV programmes are broadcast in your area, the HR-D750E automatically receives them in stereo. When a stereo programme is being received, the STEREO indicator lights and recording is made in stereo on the hi-fi audio track and in mono (mixed L + R) on the normal audio track. To listen to the stereo soundtrack during recording, set the AUDIO MONITOR button ㉛ for L and R. If this button is left set either in the L or R position, you will hear only one channel while recording, though the recording is being made in stereo.

## RECORDING BILINGUAL TV PROGRAMMES

**(Applicable only to the West German Sound-Multiplex TV system)**
When a bilingual TV programme is being received, the BILINGUAL indicator lights. There is a switch to select the soundtrack to be recorded on the normal audio track, however, because both soundtracks are recorded always on the hi-fi track for selective listening, you can ignore the switch labelled TUNER SOUND SELECT in most cases unless you need a specific soundtrack on the normal audio track.

- ●Set TUNER SOUND SELECT switch ㊴ to MAIN to record the main soundtrack (local language); to SUB to record the sub soundtrack (foreign language).
- ●To listen to the selected soundtrack from the hi-fi audio track while recording, press the AUDIO MONITOR button for either L or R.
- ●To listen to the soundtrack being recorded on the normal audio track, press the Hi-Fi/NORM/MIX button ㉟ for NORMAL.

## RECORDING FM SIMULCAST TV PROGRAMMES

FM simulcast TV programmes can be recorded using an FM stereo tuner. Connect necessary components. (Connect the FM tuner to the rear panel AUDIO IN connectors.) Select the TV channel broadcasting the simulcast programme with the recorder's channel select buttons and tune the FM stereo tuner to the station broadcasting the soundtrack for this TV programme.
The only difference from the basic recording procedure on page 15 is an additional step after step **3**.

- ●Press SC button ㉝.
  Then the SC indicator on the FDP will light. With this setting, the video and audio signals from the built-in tuner will be recorded on the video and normal audio track and the audio signal from the FM stereo tuner will be recorded on the hi-fi audio track.

**Notes:**

- ●After finishing recording, be sure to press the SC button to switch back to the Tuner mode.
- ●While recording simulcast programmes, it might happen that the hi-fi sound distorts momentarily at switching points between different programmes. This is not due to any defect of the unit.

## RECORDING A TV PROGRAMME WHILE RECORDING AN INDEPENDENT AUDIO SOURCE

Using the "simulcast" recording function, you can record independent audio and video programmes, because the TV soundtrack is not lost, but recorded on the normal audio track. While recording a TV programme, record any audio source independently.

- ●Connect an audio component (such as an FM tuner) to the AUDIO IN connectors (81).
- ●Press SC button. The SC indicator on the FDP will light.

**Notes:**

- ●If you stop recording to avoid unwanted material of the TV programme using the PAUSE/STILL button, the audio programme from an external source is also cut.
- ●If television broadcasting comes to an end during recording, the hi-fi sound being recorded from an external source may distort. It is recommended that you check the timetable of TV broadcasts in advance.
- ●After finishing recording, be sure to press the SC button to switch back to the Tuner mode; otherwise, recording on the hi-fi audio track from the built-in tuner will not be possible.

## USING THE HR-D750E AS AN AUDIO TAPE DECK

You can record audio only (without recording any video signal) on the hi-fi audio track. This means you can record a continuous 8-hour FM programme onto a single cassette (E-240).

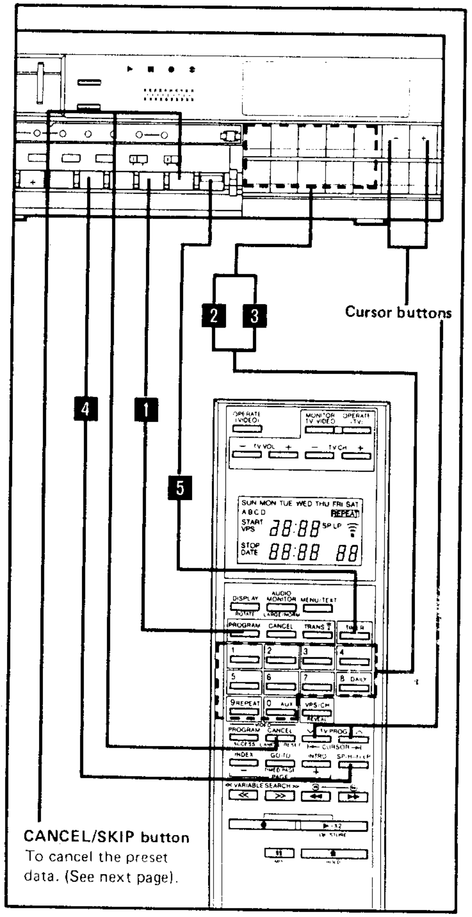
- ●Connect an audio source (such as an FM tuner) to the AUDIO IN connectors.
- ●Tune the built-in tuner to a vacant channel.
- ●Press SC button. The SC indicator on the FDP will light.
- ●In the Hi-Fi LP mode, only audio signals can be recorded.

# AUTOMATIC TIMER RECORDING

First of all, load a cassette (with safety tab in place); power will be switched on automatically.

**Three ways to perform timer programming**

- A. **Local programming:** Programme the timer using the recorder's controls while referring to the recorder's FDP
- B. **Direct remote programming:** Programme the timer using the remote control's keys while referring to the recorder's FDP.
- C. **Independent remote programming:** Programme the remote control's memory using the remote control's keys while referring to its own LCD and then transfer the data to the recorder.

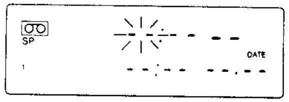


**CANCEL/SKIP button**
To cancel the preset data. (See next page).

## A. Local Programming

**1** Press PROG. ㊳.

- ●The display will change to the Timer Set mode for programme number "1". To advance to programme numbers 2 – 8, press PROG.

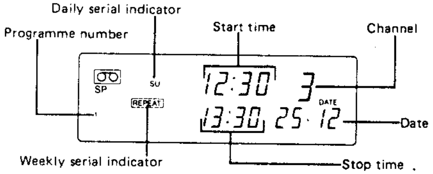


**2** Enter the start time using numeric keys ⑯.

- ●Invalid numbers will be rejected.
- ●To key in a one-digit number of hours or minutes, first press "0". Then press the relevant numeric key.

**3** When the display changes to the next stage, key in the stop time, date and channel in succession using numeric keys.

- ●To record a daily serial starting on the day of setting, press NEXT "+" ⑬ without entering any date figure.
- ●To record a daily serial starting on a certain day, press [8] and enter the date.
- ●To record a weekly serial, press [9] and enter the date.
- ●Both "daily" and "weekly" commands can be entered or cancelled by pressing the corresponding button any time in the date and time setting stages.
- ●For keying in channel numbers, refer to page 9.
- ●For programming the timer to record an external source, press the numeric key "0" while the channel is blinking; "AU" will appear in the channel display section on the FDP.



- ●When not using the VPS recording system with the VPS adapter connected, press VPS to make "VPS" disappear.

**4** Press SP/Hi-Fi LP ㉞ to obtain the desired recording mode indication on the display.

- ●The SP or Hi-Fi LP entry can be made anytime while in the Timer Set mode.

**5** After making sure that the cassette is loaded, press TIMER ㊶.

- ●The Timer Recording Standby mode will be engaged with the TIMER indicator and the preset programme number(s) illuminated and the power turned off.
- ●With no cassette loaded, the TIMER and "cassette loaded" indicators will continue blinking.
- ●A cassette whose safety tab has been removed will be rejected automatically.
- ●If a preset programme contains errors, that programme number will not be illuminated. Recheck the programmed data.

## B. Direct Remote Programming

Following the procedures above, use the remote control's buttons instead of the recorder's with the remote control directed toward the recorder's Remote Sensor window ③.

## AUDIO DUBBING

Audio dubbing means recording a new soundtrack on a pre-recorded tape. In other words, the previously recorded sound is erased and replaced with a new soundtrack. **Audio dubbing is applicable only to the longitudinal audio track (normal audio).** Therefore, a dubbed narration can be heard together with the original hi-fi sound.

**1** Switch on the TV receiver.
- Adjust the TV receiver's channel to your video channel.

**2** Load a pre-recorded cassette. Power will be switched on automatically.

**3** Connect a microphone or an audio source to the MIC IN jack ㉓ or the AUDIO/VIDEO socket (71) respectively.
- With both microphone and audio source connected, mixed sound is recorded.

**4** Press "0" of the numeric keys ⓰.
- If you record sound only from the microphone, the source equipment connected to the AUDIO/VIDEO socket should be off.

**5** Press PLAY/X2 ❺ to start playback and then press REW or FF ❹ to search for the point from which you wish to start audio dubbing.

**6** Press PAUSE/STILL ⓳ at the start point of audio dubbing.

**7** Press AUDIO DUB ❻.

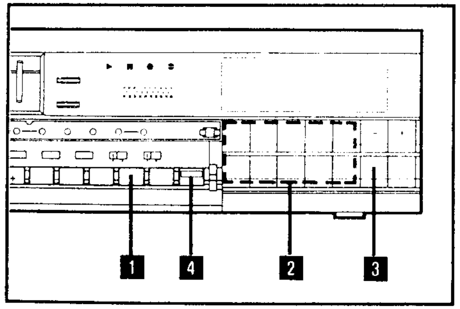
**8** Press PLAY/X2.
- Audio dubbing will start.

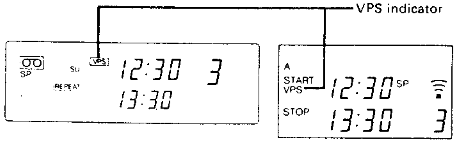
Notes:
- It is recommended that you use a lower-impedance microphone.
- If whistling or howling is heard during audio dubbing, reduce the TV volume or move the microphone farther away from the TV. Recording is being performed even if sound is not heard from the TV receiver. If you want to monitor the sound being recorded, connect headphones to the PHONES jack.
- Marking index codes is not possible while audio dubbing is being performed.

CAUTION:
Audio dubbing is not possible with an audio source connected to the rear panel AUDIO IN connectors.

## VPS RECORDING

In the VPS (Video Programme System) system, TV stations transmit different VPS codes for different TV programmes, which control the starting and stopping of the video recorder and have precedence over times preset in the timer for accurate recording of a particular programme from start to finish.





**1** Press PROG. ㊳ (or VIDEO PROGRAM (57) ) or, for the remote control's memory, (52).

**2** Set the start time, stop time, date and channel in the same way as for timer programming.

**3** Make sure that the VPS indicator is lit; if not, press VPS ⓯ or (56).
- All timer data will be converted to VPS codes and stored in memory.

**4** Press TIMER ㊶.
- The recorder will enter the VPS standby mode at 20:00 on the day previous to the preset day and remain engaged until 3:59 on the following day, if the intended programme has not yet been broadcast.
- When a VPS code corresponding to the intended TV programme is detected during the VPS standby mode, recording will start. When the VPS code changes to another, recording will stop.
- When an interruption code is detected during VPS recording, the VPS standby mode is engaged and recording restarts when the regular VPS code is restored.

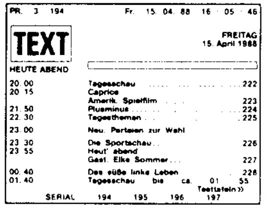
Notes:
- If no VPS code is detected from that station or a system status code which cancels VPS recording is detected, ordinary timer recording will be engaged.
- Operation at the end of VPS recording is the same as with ordinary timer recording.

## TELETEXT PROGRAMMING

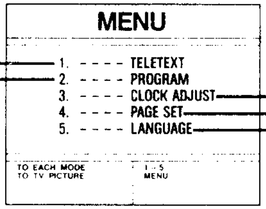
Teletext services are becoming popular and a vast number of teletext pages are now available for a variety of information. The HR-D750E is ready to take advantage of these services, not only for simple viewing but also for programming the HR-D750E's built-in timer in an extremely easy way. All you need to do is connect the optional VU-V120E VPV adapter or VU-V100E VPS/VPV adapter to the rear of the HR-D750E. Then the HR-D750E's remote control exhibits its full capability with all the dual- or triple-function control keys working as intended.

### TELETEXT

- View broadcast teletext pages.
- Several page access modes are available for quick and convenient viewing.
- Programme the timer using TV schedule pages.



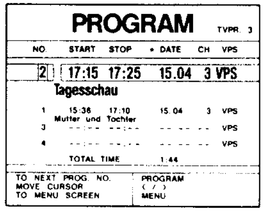
```
PR. 3 194          Fr. 15. 04. 88  16 · 05 · 46

TEXT                              FREITAG
                           15. April 1988
HEUTE ABEND
20.00   Tagesschau . . . . . . . . . . 222
20 15   Caprice
        Amerik. Spielfilm . . .        223
21.50   Plusminus . . . . . . . . . . .224
22.30   Tagesthemen . .               .225
23.00   Neu. Parteien zur Wahl
23 30   Die Sportschau . .             226
23 55   Heut' abend
        Gast. Elke Sommer . . .        227
00.40   Das süße linke Leben           228
01.40   Tagesschau   bis   ca.   01    55
                              Testtafeln >>
      SERIAL   194    195    196    197
```



```
MENU

1. - - - - TELETEXT
2. - - - - PROGRAM
3. - - - - CLOCK ADJUST
4. - - - - PAGE SET
5. - - - - LANGUAGE

TO EACH MODE      1 - 5
TO TV PICTURE     MENU
```

### PROGRAM

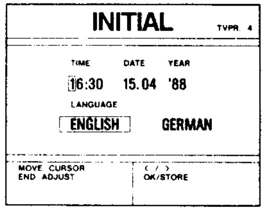
- Check the timer recording data on the colour display.
- Programme the timer manually with 10-key input.



```
        PROGRAM           TVPR. 3
 NO.  START  STOP  * DATE   CH  VPS
 2    17:15  17:25   15.04   3 VPS
      Tagesschau
 1    15:36  17:10   15.04   3  VPS
      Mutter und Tochter
 3    --:--  --:--   -- --  --  VPS
 4    --:--  --.--   -- --  --  VPS
      TOTAL TIME     1:44
TO NEXT PROG. NO.     PROGRAM
MOVE CURSOR           < / >
TO MENU SCREEN        MENU
```

### CLOCK ADJUST

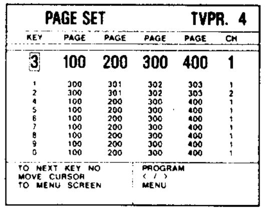
- Set the VCR's clock manually with 10-key input.



```
     INITIAL          TVPR. 4

  TIME     DATE    YEAR
  16:30    15.04   '88
  LANGUAGE
  ENGLISH      GERMAN

MOVE CURSOR     < / >
END ADJUST      OK/STORE
```

### PAGE SET

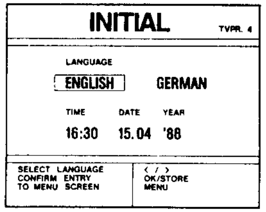
- Preset teletext pages so that you can quickly access your favourite or frequently-referred-to pages.
- Four pages can be preset for each of the keys, 0 to 9, totalling 40 pages.



```
   PAGE SET               TVPR. 4
 KEY  PAGE  PAGE  PAGE  PAGE  CH

  3   100   200   300   400   1

  1   300   301   302   303   1
  2   300   301   302   303   2
  4   100   200   300   400   1
  5   100   200   300   400   1
  6   100   200   300   400   1
  7   100   200   300   400   1
  8   100   200   300   400   1
  9   100   200   300   400   1
  0   100   200   300   400   1
TO NEXT KEY NO       PROGRAM
MOVE CURSOR          < / >
TO MENU SCREEN       MENU
```

### LANGUAGE

- Select either English or German for on-screen messages.



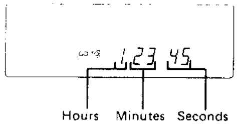
```
     INITIAL          TVPR. 4

  LANGUAGE
  ENGLISH      GERMAN

  TIME     DATE    YEAR
  16:30    15.04   '88

SELECT LANGUAGE    < / >
CONFIRM ENTRY      OK/STORE
TO MENU SCREEN     MENU
```

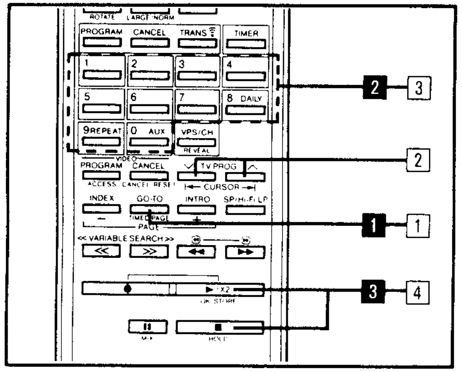
## REALTIME TAPE COUNTER FUNCTIONS

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes (Record, Play, Rewind, Fast Forward).

### Time Go-To function

The Time Go-To function gives you direct access to any point on the tape by simply specifying the time from the beginning of the tape.





1 Press GO-TO (61) while in the Play, Stop or Still mode.
- The counter will change to the Go-To mode.

2 Specify the time (from the beginning of the tape) to the point to be located, by using the numeric keys (55).

3 Press ▶/X2 (67) or ■ (69).
- Always key in a full number.
- Depending on the situation, search will take place either in the Shuttle Search mode or in the Rewind or Fast Forward mode which is much faster than the Shuttle Search mode. After the specified point is reached, playback starts automatically or the tape stops automatically depending on the command.

| | |
|---|---|
| Pressing ▶/X2 from Play or Still mode: | Shuttle Search – Automatic start of playback |
| Pressing ▶/X2 from Stop mode: | ◀◀ or ▶▶ – Automatic start of playback |
| Pressing ■ from Play, Still or Stop mode: | ◀◀ or ▶▶ – Automatic stop |

- If the recorder did not detect the leader tape when the cassette was loaded (indicated by "-H--M--S" when the Go-To button is pressed), the tape is first rewound to the beginning of the tape and then is fast-forwarded to the specified point.

### Time Search function

The Time Search function lets you locate a point on the tape a specified time span away from the current position in either direction.

1 Press GO-TO (61) while in the Play, Stop or Still mode.

2 Press TV PROG. "∨" or "∧" (59) to specify the direction of search.

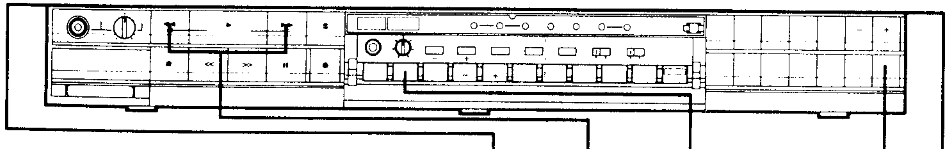
3 Specify the time (from the current position) to the point to be located, by using the numeric keys (55).

4 Press ▶/X2 or ■.

- The tape will move to the specified point and automatically start playback or stop.

Notes:
- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- If the GO-TO button was pressed in the Play or Still mode, when the specified point is reached, a still picture will be displayed as a result of having pressed the ▮▮ button, instead of ▶/X2 or ■, after having keyed in the time.
- Use of other control buttons, while in either the Time Go-To or Search mode, cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops.

## COUNTER MEMORY FUNCTION/LAP TIME INDICATION



### Counter Memory function

1 Press COUNTER RESET ⑭ at a point which you may wish to locate later.
- The counter will read "0H 00M 00S".

2 Press COUNTER MEMORY ㉘. M will appear in the FDP.

3 Press REW (or FF) ④ when you need to return to the designated point.

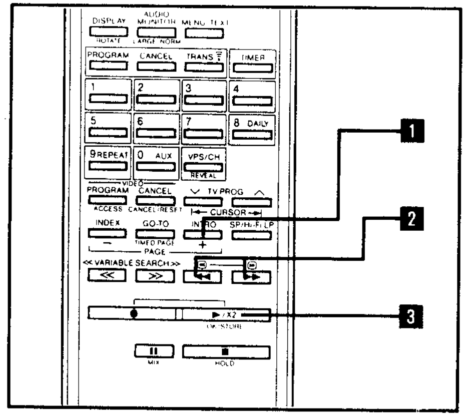
The tape will rewind (or fast forward) and stop at about the "0H 00M 00S" counter reading automatically.

### Lap Time Indication

When you need to know the exact time of a recording, press the COUNTER RESET button before starting recording or playback. The counter will be reset to "0H 00M 00S" and show the exact elapsed time as the tape runs.

## INTRO SEARCH FUNCTION

The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a programme each time an index code is detected.



1 Press INTRO (63) while in the Play or Stop mode.
- The INDX indicator on the FDP will light.

2 Press the ◀◀ or ▶▶ button (65) within 2 seconds.
- The Intro Search will start in the corresponding direction.
- Each time an index code is detected, the corresponding part is played back at the search speed (9 times normal) for about 5 seconds.

3 When you find the section you want to view, simply press the ▶/X2 button (67).
- Normal playback will start.

## NEXT-FUNCTION MEMORY

**Memory Play function**
- If you want to watch the tape from its beginning after rewinding, press the REW button and then PLAY/X2 within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator M is off.)
- If you want to watch the tape from the counter reading of "0H 00M 00S", press the COUNTER MEMORY button to obtain M. Then, press the REW (or FF) button and then PLAY/X2.
- While the tape is being rewound, the PLAY/X2 indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY/X2, FF, REW)

**Memory Eject/Power-Off/Timer Standby**

If you are going to eject the cassette, turn the power off or engage the Timer Standby mode after rewinding the tape, you don't have to wait for completion of rewind to press the corresponding button.
- To eject the cassette after rewind, press REW and then EJECT within 2 seconds. (To cancel the Memory Eject mode, press STOP.)
- To turn the power off after rewind, press REW and then OPERATE within 2 seconds. (To cancel the Memory Power-off mode, press OPERATE.)
- To engage the Timer Standby mode after rewind, press REW and then TIMER within 2 seconds. (To cancel the Memory Timer Standby mode, press TIMER.)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Memory Play | REW/FF | → | PLAY/X2 | PLAY/X2 | Blinking | → | Play mode |
| Memory Eject | REW | → | EJECT | | Blinking | → | Cassette ejected |
| Memory Power-off | REW | → | OPERATE | OPERATE | Blinking | → | Power off |
| Memory Timer Standby | REW | → | TIMER | TIMER | Lights | → | Timer standby mode |
| | within 2 seconds | | | | | | |

## RECORDING FROM AN EXTERNAL SOURCE

By connecting an external video source (such as a VideoMovie camera-recorder, 2nd video recorder, video camera, etc.) to the AUDIO/VIDEO socket (71) , recording and/or editing are possible.

- For connection of these units, an appropriate cable is necessary.
- For connection of a video camera, a camera adapter is also necessary. Connect the camera adapter's PAUSE terminal to the recorder's PAUSE connector (79) , then you can control taping start/stop with the camera's start/stop switch. For proper connection of a camera, consult a JVC dealer.

1. Turn the power on for all connected equipment.
2. Adjust the TV receiver to your video channel.
3. Load a cassette.
4. Press either CH (–/+) button ⑬ or the numeric key 0/AUX ⑯ to obtain "AU" in the channel display.
5. Press SP/Hi-Fi LP ㉞ for required mode.
6. Operate the source equipment properly.
7. Press REC/ITR ⑱ .
   - When recording with a camera, press REC/ITR and PAUSE/STILL to enter the Recording Standby mode, then control taping start/stop with the camera's start/stop switch.
8. To stop recording temporarily, press PAUSE/STILL ⑲ .
9. To end recording, press STOP ㉑ .

**Note:**

- For the operation of the source equipment, refer to the instruction manual of the relevant machine.

## IN CASE OF DIFFICULTY

What may initially appear to be trouble is not always a real problem. Make sure first . . . .

### POWER AND TAPE TRANSPORT PROBLEMS

| Symptoms | Check points |
|---|---|
| No power is applied to the recorder. | ● Is the power cord disconnected?<br>– Connect it. |
| Clock is functioning properly, but the recorder cannot be powered. | ● Is the TIMER indicator lit on the FDP?<br>– Press TIMER to disengage the Timer Recording Standby mode. |
| Tape does not run during recording. | ● Is the PAUSE/STILL button engaged?<br>– Press the PLAY/X2 button. |
| Tape stops in the Rewind or Fast-Forward mode. | ● Is the COUNTER MEMORY button pressed to ON?<br>– Press it so M no longer appears on the FDP. |
| Tape will not rewind or fast forward. | ● Is the tape already fully rewound or fast forwarded?<br>– Check the cassette. |

### RECORDING PROBLEMS

| Symptoms | Check points |
|---|---|
| Recording cannot be started. | ● Is a cassette loaded?<br>● Is the safety tab on the cassette removed?<br>– Reseal the slot with cellophane tape. |
| Camera recording is not possible. | ● Are the camera and the camera adapter correctly connected?<br>● Is the power switch of the camera adapter set to ON?<br>● Does the channel display indicate "AU"?<br>– Press "0/AUX". |
| Simulcast recording is not possible. | ● Has the SC button been pressed?<br>– Press it so "SC" appears on the FDP.<br>● Is an audio source correctly connected to the AUDIO IN connectors?<br>– Check connections. |
| Timer recording is not possible. | ● Have you set the clock correctly and programmed the timer correctly?<br>– Check once again.<br>● Is the TIMER indicator lit on the FDP?<br>– Press TIMER. |

### PLAYBACK PROBLEMS

| Symptoms | Check points |
|---|---|
| Playback picture does not appear while the tape is running. | ● Is the TV receiver's channel selector set to the correct video channel?<br>– Set it to the RF converter channel. (See page 8.) |
| Noise appears during playback. | ● Press TRACKING buttons. |
| Playback picture is blurred or interrupted while TV broadcasts are clear. | ● Video heads may be dirty.<br>– Head cleaning is necessary. Consult your JVC dealer. |

### HI-FI AUDIO PROBLEMS

| Symptoms | Check points |
|---|---|
| TV sound cannot be recorded on hi-fi audio track. | ● Has the SC button been pressed?<br>– Press it again so "SC" no longer appears on the FDP. |
| Soundtrack on the hi-fi audio track cannot be reproduced. | ● Is the NORMAL indicator lit?<br>– Press the Hi-Fi/NORM/MIX button for L and R to light as required. |

### OTHERS

| Symptoms | Check points |
|---|---|
| Whistling or howling is heard from TV. | ● Move camera or microphone away from TV or reduce TV sound volume. |
| Some channels are skipped over when selecting a channel. | ● Those channels are preset to be skipped over. If you need them, restore them. (See page 10.) |
| Channel cannot be switched. | ● Is recording in progress?<br>– Press PAUSE/STILL, select a desired channel and press PLAY/X2. |

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

## HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.
- Dirt accumulated on the video heads after long periods of use causes such problems. In this case, head cleaning requiring highly technical care is necessary.

For head cleaning, consult your JVC dealer.

### 1.1.3 Disassembly

1. Top cover
1) Take out five screws from the right, left and rear sides of the set.
2) Tilt up the rear end of the top cover, then remove it.

2. Front panel
1) Remove the top cover.
2) Bend three upper hooks of the front panel assembly upward to disengage them from their chassis retainers.
3) Disengage three lower hooks of the front panel assembly from their chassis retainers in order to remove the front panel assembly.

3. Bottom cover
1) Take out three screws from the bottom side of the set.
2) Set free the bottom cover from its six retainers of the chassis in order to remove the bottom cover.

4. Cassette housing door
1) Remove the front panel assembly.
2) Bend center of the cassette housing door toward you, then pull out the right end from the cassette housing.
3) Use care regarding the torsion spring, then pull out the left end of the cassette housing door to remove it.

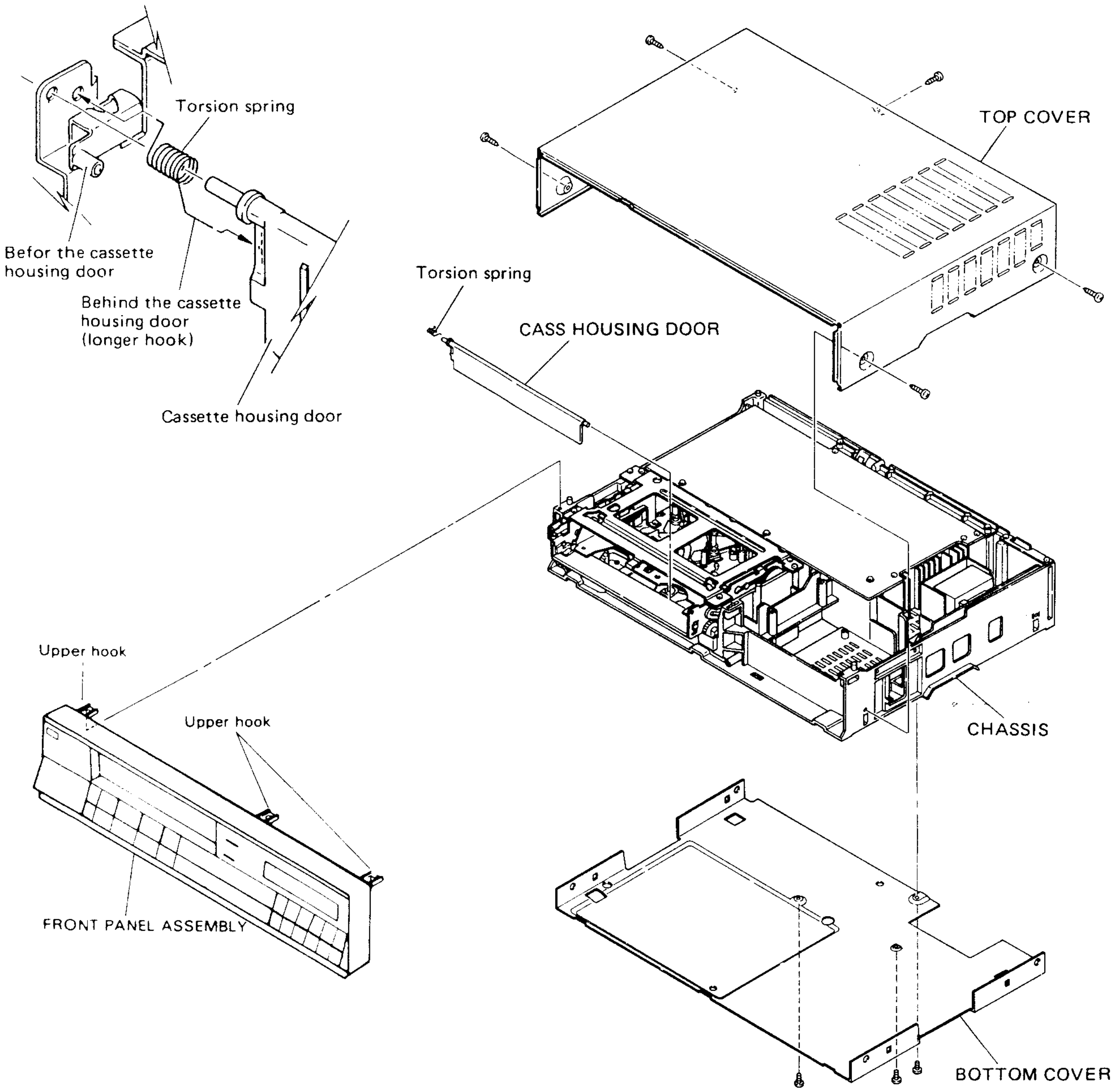

Torsion spring
Befor the cassette
housing door
Behind the cassette
housing door
(longer hook)
Cassette housing door
Torsion spring
CASS HOUSING DOOR
TOP COVER
Upper hook
Upper hook
FRONT PANEL ASSEMBLY
CHASSIS
BOTTOM COVER

**Fig. 1-1-1** Removal of external covers

# SECTION 1
# MECHANISM ADJUSTMENTS

## 1.1 GENERAL

### 1.1.1 Precautions

**IMPORTANT:**

1. Disconnect unit from power before removing or soldering components.
2. When removing a fastener (screw, washer, etc.), be careful not to drop it into the mechanism. If a fastener should be dropped, be sure to retrieve it.
3. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.
4. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the tape guides and rotary video head drum.)
5. For service procedures that call for operation of the set when the cassette housing is separated from the main-deck, perform as below.

1) Set a sheet of insulated material on the right of the chassis.
2) Remove the cassette housing from the main-deck and place it on the insulated sheet, but do not disconnect the connector from the M. CTL board.
3) Insert a cassette into the cassette housing. The housing mechanism functions to retract the cassette.
4) Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
5) The desired modes can be obtained by using the opration switches.

### 1.1.2 Required test equipment, fixtures and tools

For proper mechanical adjustment, the following test equipment, fixtures and tools are strongly recommended. Without them, a long trial-and-error period would be necessary, resulting in possible damage. In addition, general-purpose tools are required.

1. Test equipment required:
    Color television or monitor
    Oscilloscope: Wide-band, dual trace, triggered, delayed sweep
    Recording tape
    Alignment tapes

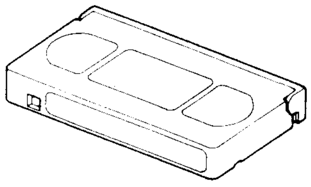
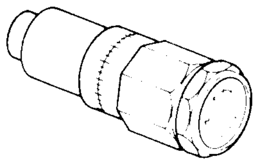
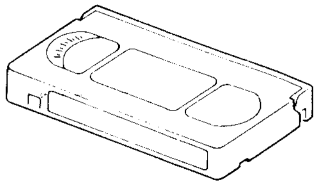
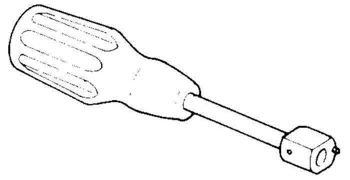
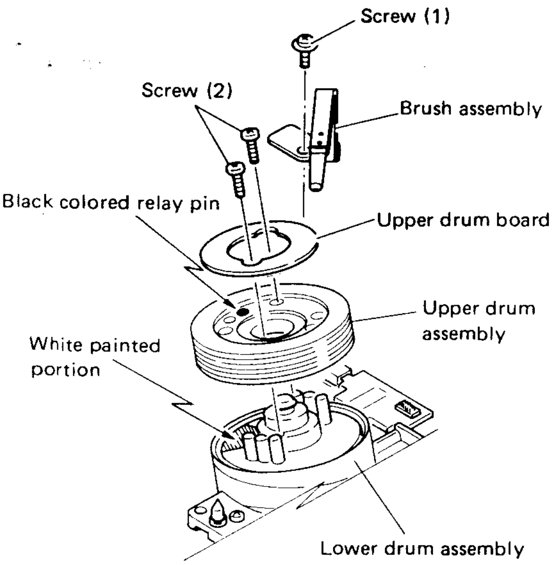
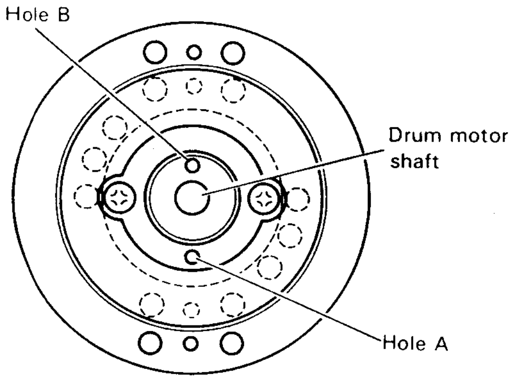
| | | |
|---|---|---|
| Alignment tape MH-2<br> | Torque gauge assembly PUJ48075-2<br> | Back tension cassette gauge PUJ48076-2<br> |
| A/CTL head position tool PUJ47351-2<br> | | |

Table 1-1-1 Fixtures and tools

## 1.2 MAIN ASSEMBLY REPLACEMENT

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 1 | Upper drum assembly<br>– Removal –<br> Screw (1)<br>Screw (2)<br>Brush assembly<br>Black colored relay pin<br>Upper drum board<br>Upper drum assembly<br>White painted portion<br>Lower drum assembly<br>**Fig. 1-2-1** Upper drum assembly | | | **Note:** When installing the new upper drum, use care not to touch the video heads. If heads are soiled, clean with a soft, finely woven cotton cloth or chamois that has been moistened in alcohol. Hold lightly against the heads and turn the drum clockwise. By no means clean with a vertical stroke.<br>1) Refer to Fig. 1-2-1. Take out screw (1) and remove the brush assembly.<br>2) Use a desoldering tool or desoldering braid to unsolder the upper drum boards.<br>3) Take out two screws (2) and raise the upper drum to remove it together with the upper drum board. (If this drum is to be reinstalled, use care not to touch or damage the heads.) |
| | – Installation –<br> <br>**Fig. 1-2-2** Polarity of the upper drum | | | 1) Install a new upper drum assembly so that the black-colored relay pin of the upper drum assembly overlies the white painted portion of the lower drum assembly, as shown in Fig. 1-2-1.<br>**Note:** Be sure to position the upper drum correctly. As indicated in Fig. 1-2-2, set hole A of the upper drum opposite the shaft from hole B of the lower drum. Check for correct position before tightening the screws.<br>2) Tighten two screws in a balanced manner.<br>3) Set the DRUM PWB on the upper drum assembly, then resolder it.<br>4) Clean the drum unit (particularly clean the upper drum assembly).<br>5) Mount the brush assembly in the original position, then tighten the screw to fix the brush assembly. |
| | – Checks and adjustments – | | | After installing the upper drum, perform the following checks and adjustments (refer to appropriate Sections of this Manual).<br>1) FM waveform<br>2) Servo circuit<br>3) Video circuit<br>4) FM audio circuit |

### 1.1.4 Layout of main parts

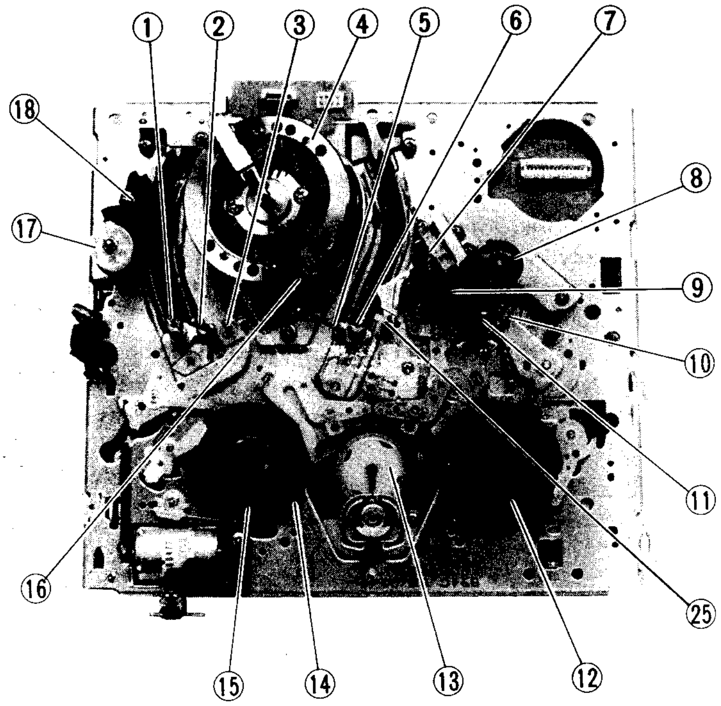


**Fig. 1-1-2** Top view of main-deck

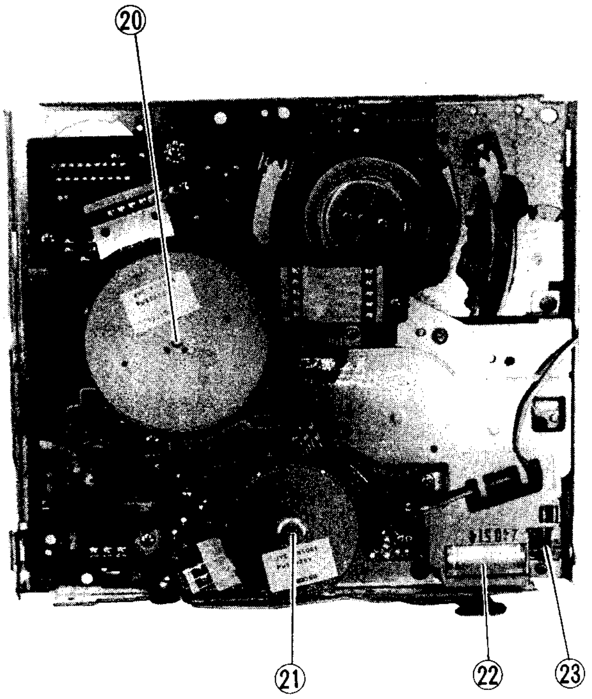


**Fig. 1-1-3** Bottom view of main-deck

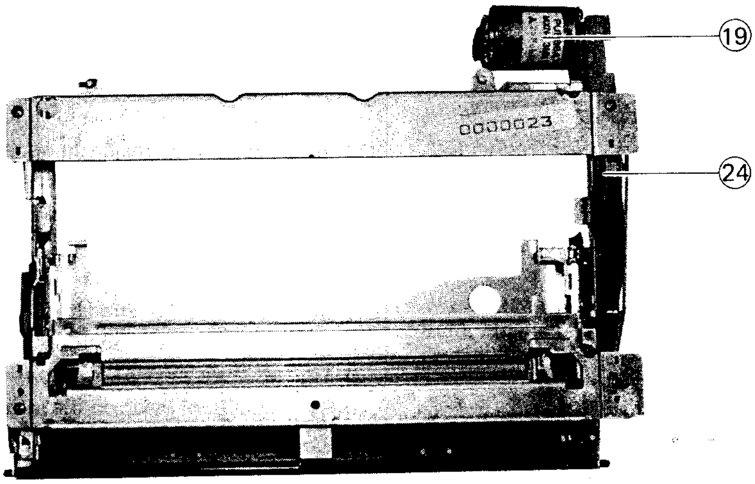


**Fig. 1-1-4** Cassette housing

1. Supply guide roller
2. Supply slant pole
3. Tension pole
4. Upper drum
5. Take-up slant pole
6. Take-up guide roller
7. A/C head
8. Pinch roller
9. Take-up guide pole
10. Guide arm
11. Capstan
12. Take-up reel disk
13. Reel idler
14. Tension band
15. Supply reel disk
16. Lower drum
17. Impedance roller
18. Full erase head
19. Cassette motor
20. Capstan motor
21. Reel motor
22. Mode motor
23. Mode belt
24. Cassette belt
25. Half loading pole

### 1.1.4 Layout of main parts

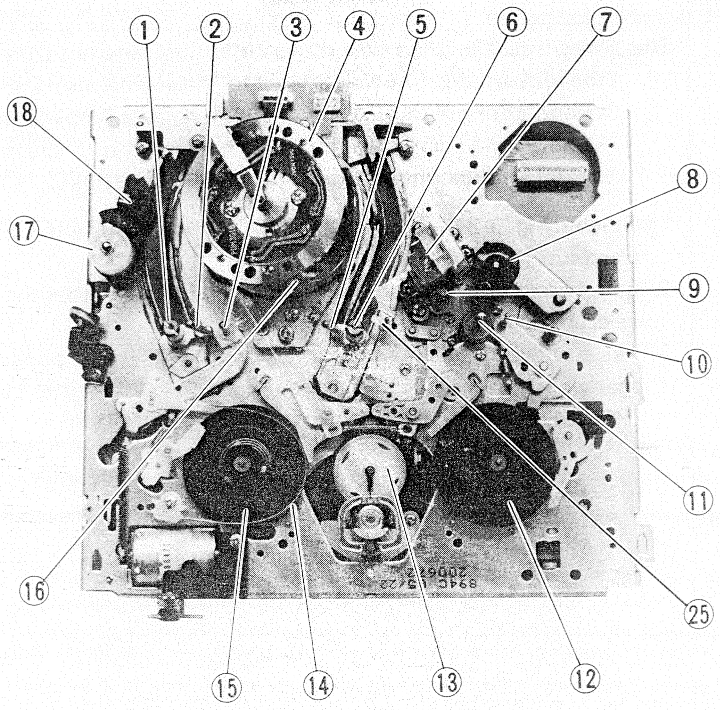


Fig. 1-1-2 Top view of main-deck

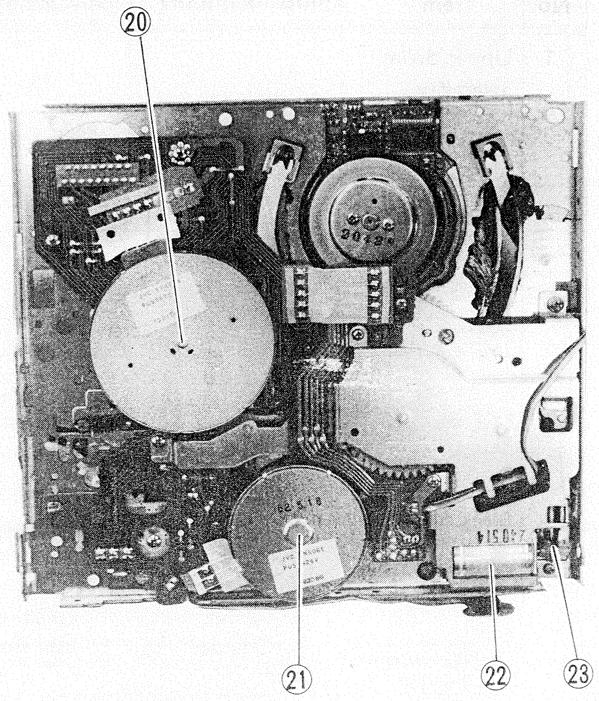


Fig. 1-1-3 Bottom view of main-deck

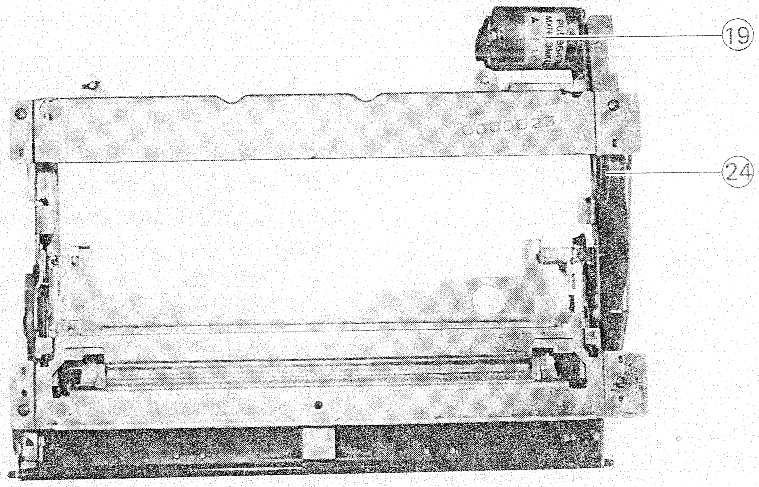
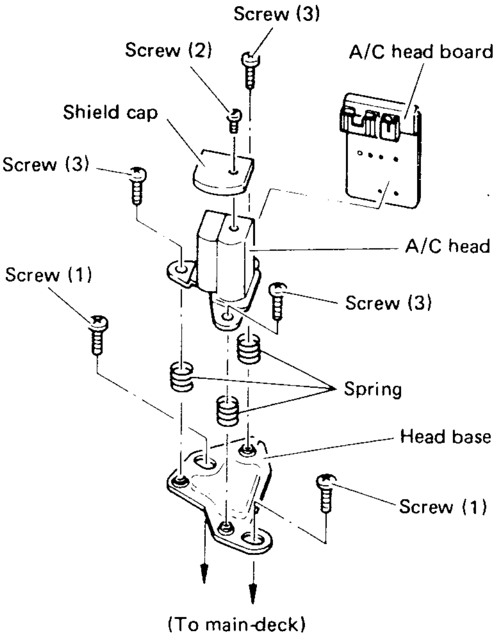
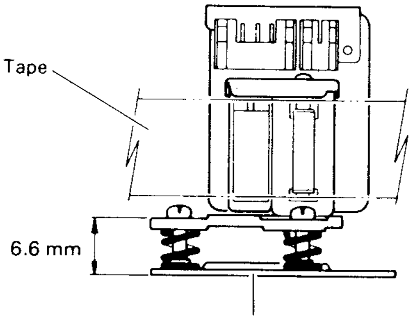
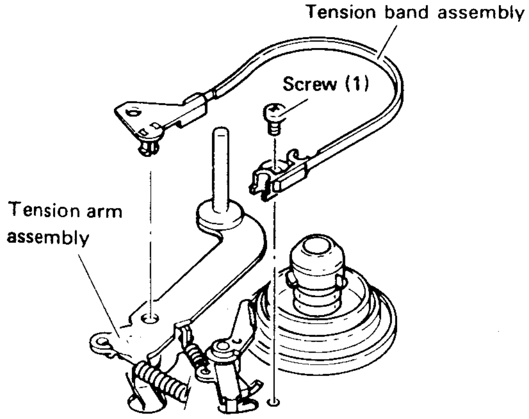


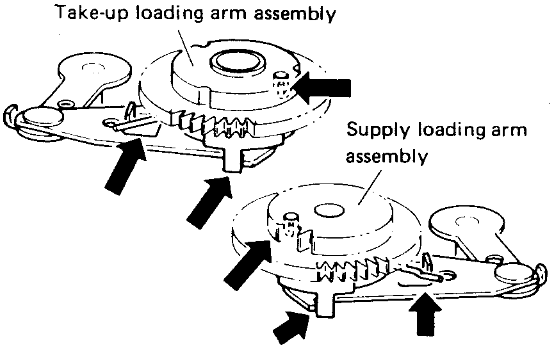
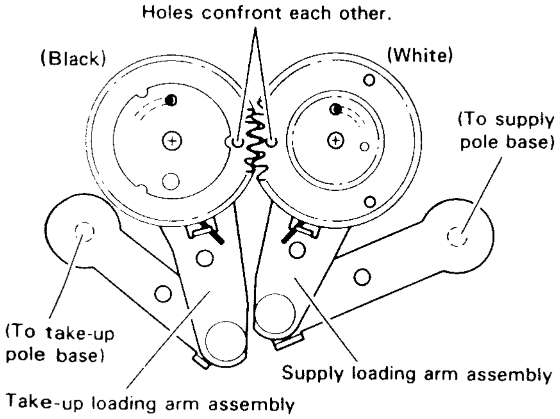
Fig. 1-1-4 Cassette housing

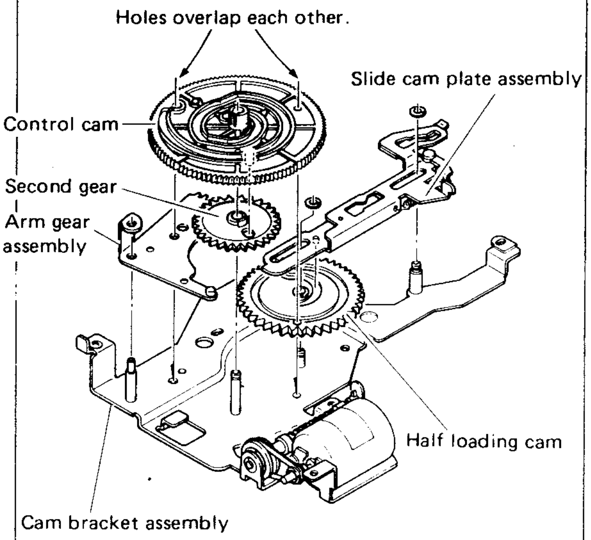
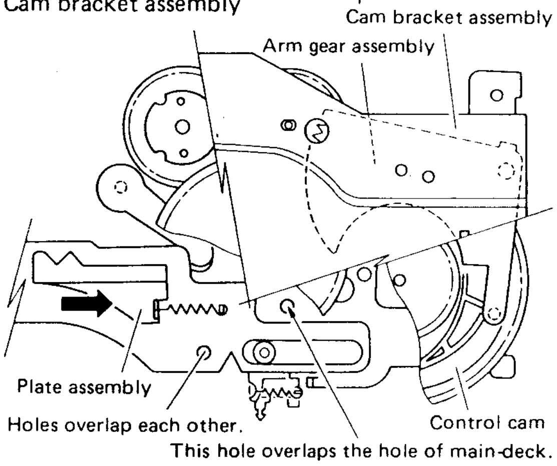
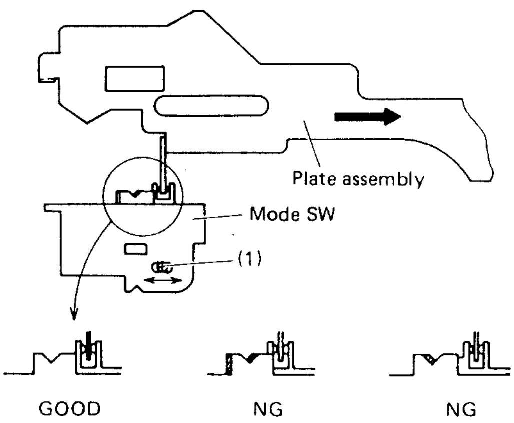
1. Supply guide roller
2. Supply slant pole
3. Tension pole
4. Upper drum
5. Take-up slant pole
6. Take-up guide roller
7. A/C head
8. Pinch roller
9. Take-up guide pole
10. Guide arm
11. Capstan
12. Take-up reel disk
13. Reel idler
14. Tension band
15. Supply reel disk
16. Lower drum
17. Impedance roller
18. Full erase head
19. Cassette motor
20. Capstan motor
21. Reel motor
22. Mode motor
23. Mode belt
24. Cassette belt
25. Half loading pole

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 2 | A/C head (Audio/Control head) | | | |
| | – Removal –<br> Screw (3)<br>Screw (2)<br>A/C head board<br>Shield cap<br>Screw (3)<br>A/C head<br>Screw (1)<br>Screw (3)<br>Spring<br>Head base<br>Screw (1)<br>(To main-deck)<br>**Fig. 1-2-2** A/C head | | | 1) Disengage connectors attached to the A/C head board.<br>2) Take out two screws (1) and remove the A/C head together with the head base.<br>3) Unsolder and remove the A/C head board from the A/C head.<br>4) Take out screw (2) and remove the shield cap from the A/C head.<br>5) Take out three screws (3) and remove the A/C head from the head base. Use care regarding the three springs. |
| | – Installation –<br> Tape<br>6.6 mm<br>Head base<br>**Fig. 1-2-3** A/C head height | | | 1) Install the A/C head by reversing the removal steps of above.<br>2) Temporarily set the A/C head height above the head base for 6.6 mm (see Fig. 1-2-3). |
| | – Checks and adjustments – | | | 1) Use a spare tape (not Alignment tape) and confirm proper operation of the tape transport (see Section 1.5).<br>2) Perform interchangeability adjustment (see Section 1.6). |

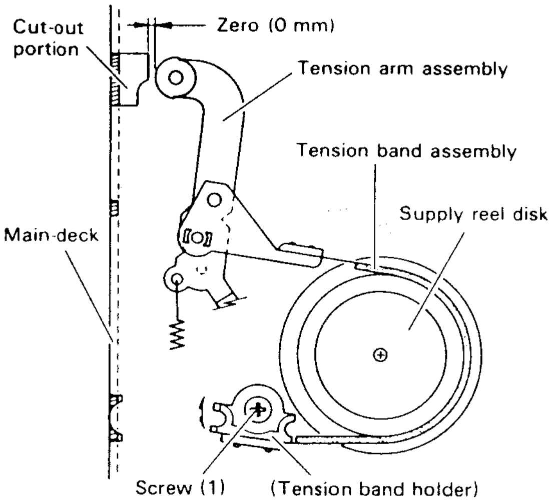
| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 3 | Tension band assembly<br><br> Tension band assembly<br>Screw (1)<br>Tension arm assembly<br>Fig. 1-2-4 Tension band assembly | | | 1) Take out screw (1) and disengage the tension band assembly from the tension arm assembly (see Fig. 1-2-4).<br>2) Remove and replace the tension band assembly.<br>3) Perform tension pole position adjustment (see Section 1 .4). |

## 1.3 ASSEMBLY PROCEDURE OF MECHANISM

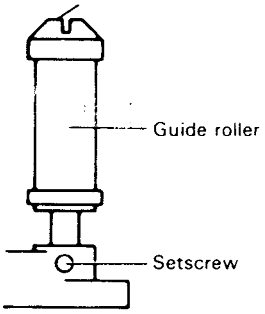
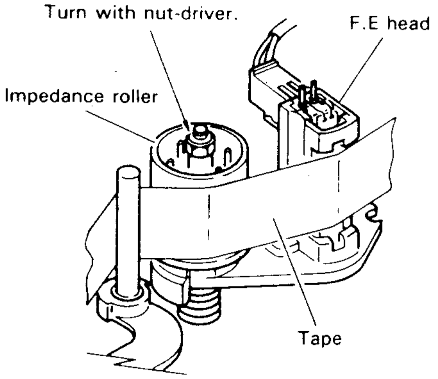
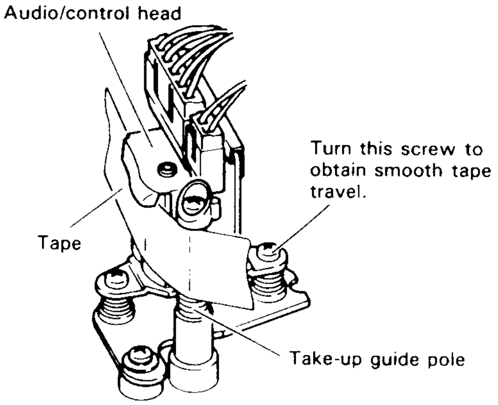
| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| | A close relationship exists between the mode select switch and the mechacon circuit. Therefore, the mode select switch and control arm engagement determines the overall mechanical operations of the levers, gears, rollers, etc. If these parts are not properly positioned, the video deck becomes stalled in the unloading or Stop mode. | | | |
| 1 | Loading arm assemblies<br><br> Take-up loading arm assembly<br>Supply loading arm assembly<br>Fig. 1-3-1 Loading arm assembly (1)<br><br> Holes confront each other.<br>(Black)<br>(White)<br>(To supply pole base)<br>(To take-up pole base)<br>Supply loading arm assembly<br>Take-up loading arm assembly<br>Fig. 1-3-2 Loading arm assembly (2) | | | These assemblies are comprised of loading gears, torsion springs and loading arms.<br>1) Refer to Fig. 1-3-1 and install the loading arm assemblies correctly.<br>2) The take-up and supply loading arm positions with respect to the loading gear holes are indicated in Fig. 1-3-2. This configuration is important to allow shifting to the next operation. |

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 2 | Control cam<br><br> Holes overlap each other.<br>Slide cam plate assembly<br>Control cam<br>Second gear<br>Arm gear assembly<br>Half loading cam<br>Cam bracket assembly<br>**Fig. 1-3-3** Control cam | | | 1) Install the half loading cam on the cam bracket assembly, then mount the slide cam plate assembly so that its stud sets into the groove on the half loading cam.<br>2) Install the arm gear assembly on the cam bracket assembly.<br>3) Assemble the second gear and the control cam so that the stud of the control cam sets into the hole of the second gear.<br>4) Mount the above assembly (control cam and second gear) on the cam bracket assembly to satisfy the relation indicated in figure.<br>5) Do not turn the control cam from this position for the next step. |
| 3 | Cam bracket assembly<br><br> Cam bracket assembly<br>Arm gear assembly<br>Plate assembly<br>Holes overlap each other.<br>Control cam<br>This hole overlaps the hole of main-deck.<br>**Fig. 1-3-4** Cam bracket assembly | | | 1) Refer to Fig. 1-3-4 and press the plate assembly toward the right to overlap the indicated hole with that of the main deck.<br>2) Then install the cam bracket assembly.<br>**Note:** If the arm and loading gears do not mesh properly, use a jeweler's screwdriver or similar tool to engage the gear teeth while installing the cam bracket assembly. |
| 4 | Mode switch position<br><br> Plate assembly<br>Mode SW<br>(1)<br>GOOD<br>NG<br>NG<br>**Fig. 1-3-5** Mode switch | | | 1) Engage the plate assembly and mode switch as shown in Fig. 1-3-5. Partially tighten screw (1) to where the switch can still be shifted for adjusting the position.<br>2) Press the plate assembly toward the right to where the holes are overlapped as in Fig. 1-3-4. Insert a jeweler's screwdriver into the holes to keep them aligned.<br>3) Shift the mode switch to align the V-notch as indicated in Fig. 1-3-5. Then tighten screw (1) to secure.<br>4) Remove the jeweler's screwdriver, then reinstall and solder the circuit board. |

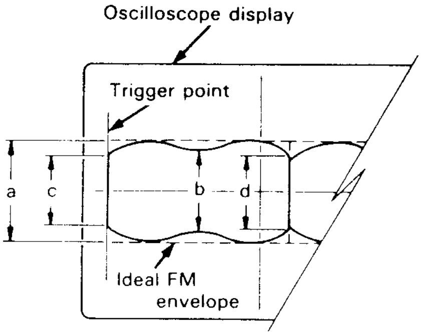
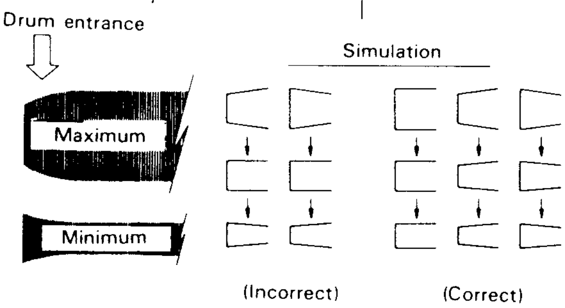
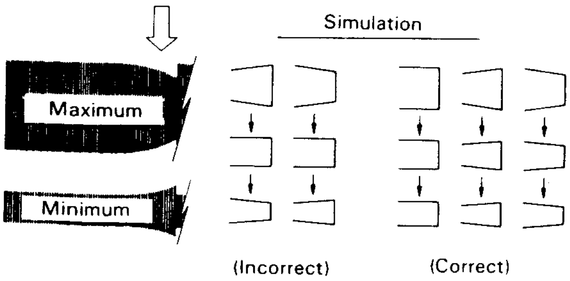
## 1.4 CONFIRMATION AND ADJUSTMENT

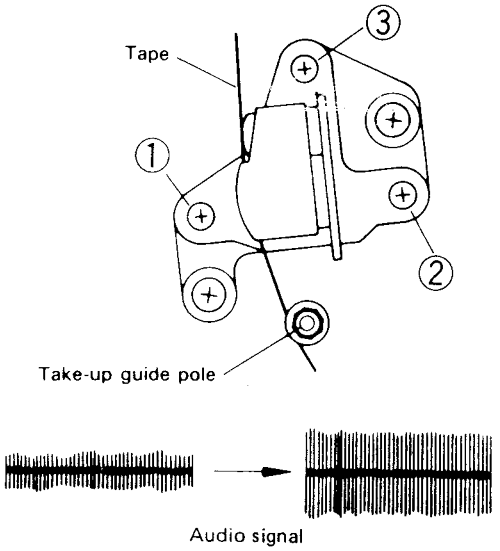
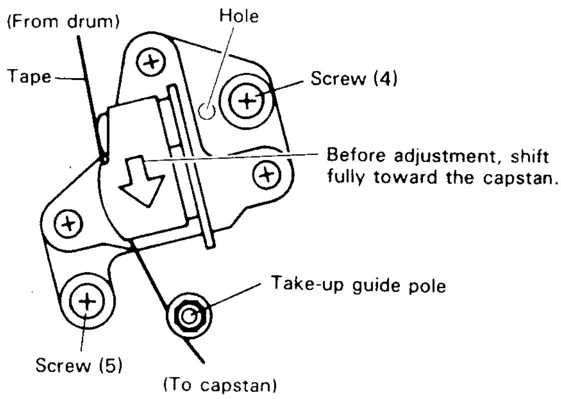
| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 1 | Tension pole position<br><br> Cut-out portion<br>Zero (0 mm)<br>Tension arm assembly<br>Tension band assembly<br>Supply reel disk<br>Main-deck<br>Screw (1)<br>(Tension band holder)<br>Fig. 1-4-1 Tension pole position | | | 1) Without a cassette tape, set for the Play mode (see Section 1.1).<br>2) Refer to Fig. 1-4-1. Slightly loosen screw (1). Adjust the tension band holder position for 0 mm separation between the tension arm and cutout position.<br>3) Tighten screw (1) to secure the tension band holder.<br>4) Use the back tension cassette gauge and set for the Play mode.<br>5) Check for a scale reading between 25 and 75.<br>6) If outside this range, clean the tension band contacting portions of the supply reel disk with alcohol, or check the condition of the tension arm spring. If necessary, replace the tension band assembly. |
| 2 | Take-up torque | | | 1) Without a cassette tape, set for the Play mode (see Section 1.1).<br>2) Set the torque gauge on the take-up reel disk.<br>3) Grasp the torque gauge lightly so that it rotates and read the value when the scale matches the indicator needle. Confirm a value between 45 and 155.<br>4) If outside this range, clean the rubber portion of the idler arm with alcohol, or if necessary, check the reel motor drive circuit. |

## 1.5 TAPE TRANSPORT CHECKS AND ADJUSTMENT PREPARATIONS

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| | The tape transport system has been precision-adjusted at the factory and ordinarily does not require readjustment. However, adjustment may become necessary after long term usage or after replacing parts that affect the tape transport. The following steps mainly cover preparations for the interchangeability adjustments of Section 1.6. | | | |
| 1 | Guide roller<br><br> Turn with screw-driver.<br>Guide roller<br>Setscrew<br>**Fig. 1-5-1** Guide roller | | | 1) During interchangeability adjustments, the guide roller is turned with a flat-blade screwdriver to adjust its height and correct FM waveform linearity. Use a metric hex key (1.25 mm) to slightly loosen the setscrew at the base of the guide roller (see Fig. 1-5-1). Loosen the setscrew just sufficiently to allow the guide roller to be turned. If too loose, tape transport will be too unstable to permit correct adjustment. |
| 2 | Impedance roller<br><br> Turn with nut-driver.<br>F.E head<br>Impedance roller<br>Tape<br>**Fig. 1-5-2** Impedance roller | | | 1) This compensates for tape running stability between the cassette and head drum. After adjusting the supply guide roller, the impedance roller height is adjusted for smooth tape transport at the lower flange.<br>2) Use a metric nutdriver (5.5 mm) to adjust by turning the upper nut (see Fig. 1-5-2). However, note that excess turning can disturb the FM waveform stability. |
| 3 | A/C head (audio/control head)<br><br> Audio/control head<br>Turn this screw to obtain smooth tape travel.<br>Tape<br>Take-up guide pole<br>**Fig. 1-5-3** A/C head | | | 1) After adjusting the take-up guide roller, adjust the A/C head inclination for smooth tape travel at the lower flange of the take-up guide pole. Refer to Fig. 1-5-3. |

## 1.6 INTERCHANGEABILITY CHECKS AND ADJUSTMENTS

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| | Before using costly Alignment tape, use a spare tape and confirm correct operation of the tape transport. | | | |
| 1 | FM waveform<br>$\frac{b}{a} \geqq 0.7$, $\frac{c}{a} \geqq 0.5$ and $\frac{d}{a} \geqq 0.5$<br> Oscilloscope display<br>Trigger point<br>a<br>c<br>b<br>d<br>Ideal FM envelope<br>Fig. 1-6-1 FM envelope<br> Drum entrance<br>Simulation<br>Maximum<br>Minimum<br>(Incorrect)<br>(Correct)<br>Fig. 1-6-2 Drum entrance<br> Drum exit<br>Simulation<br>Maximum<br>Minimum<br>(Incorrect)<br>(Correct)<br>Fig. 1-6-3 Drum exit | | | 1) Connect oscilloscope to the FM OUT testpoint of the video playback circuit. Trigger the oscilloscope externally with the signal from the drum flipflop (D-FF or FF) testpoint. Set the trigger slope to minus (−).<br>2) Play the MH-2 Alignment tape and adjust the tracking for maximum FM waveform output. Refer to Fig. 1-6-1. Confirm the relationships indicated in the figure for maximum output (a), minimum center output (b), minimum output at the drum intake (c) and minimum output at the drum output (d).<br>3) Adjustment is required if the above specifications are not fulfilled. Even when these are fulfilled, check that the FM waveform varies linearly overall. If not, slight deviation in tracking will cause a large proportional level drop to result in noise appearing in the picture. Therefore, in this condition, proceed to the following checks and perform adjustments where necessary.<br>4) Operate the tracking adjustment between minimum and maximum outputs of the FM waveform. Observe the portion of the waveform corresponding to the drum intake (see Fig. 1-6-2). As the tracking is adjusted, although the gain may increase or decrease, the geometric shape of this part of the waveform should remain consistent.<br>If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the supply guide roller height.<br>5) Next observe the portion of the waveform corresponding to the drum output (see Fig. 1-6-3), while operating the tracking adjustment. This should also vary only in gain, but not in shape.<br>If the shape varies, as shown by the incorrect examples in the figure, carefully perform adjustment of the take-up guide roller height.<br>6) Check the overall FM waveform. Fine-adjust both guide rollers so that variation is as minimum and linear as possible.<br>7) Observe the tape travel at the guide rollers and guide poles. Confirm absence of tape creasing or curling.<br>Confirm that the tape properly rides at the lower flange of the supply guide pole. Carefully adjust the guide pole height if necessary. This adjustment is important and affects FM waveform response.<br>If creasing or curling is observed at the take-up guide pole, carefully adjust the audio/control head inclination so that the tape rides properly at the lower flange of the guide pole.<br>Finally, again check the FM waveform. |

<table>
<tr><th>No.</th><th>Item</th><th>Adjustment parts</th><th>Operating mode</th><th>Description</th></tr>
<tr><td rowspan="2">2</td><td colspan="4">Proper adjustment of the A/C head position is important for ensuring adequate audio output and S/N. Severe misalignment can prevent control signal pick-up and cause servo instability. Precise adjustment is particularly important for models that include tape indexing and addressing features, since these rely on control signal coding for operation.<br>To observe the audio signal, connect an oscilloscope to the test point (AUDIO OUT) of the audio circuit, or directly to the audio output terminal. In some cases, monitoring the sound with headphones may be helpful.</td></tr>
<tr><td colspan="3">A/C head adjustments<br> <br>Fig. 1-6-4 A/C head</td><td>1) Play the stairstep (audio 7 kHz) portion of the MH-1 Alignment tape.<br>2) Adjust screw (3) (Fig. 1-6-4), which is the azimuth adjustment, for maximum output.<br>3) Turn screws (1), (2) and (3) by small and equal increments (about 45° at a time) to adjust the A/C head height for maximum audio output. Slightly raise and lower the height to confirm the maximum output position.<br>4) Observe the FM waveform and tighten the guide roller setscrews. Use care not to disturb the height adjustments. Then again confirm the FM waveform.</td></tr>
<tr><td rowspan="2">3</td><td colspan="4">This determines the distance between the sound and picture information on the tape. Correct adjustment is important for providing synchronization of picture and sound in the program.<br>Observe the FM waveform by connecting an oscilloscope to the video play-back circuit test point (FM OUT). Trigger the oscilloscope externally with the drum flipflop signal. Use plus (+) trigger to view the CH-2 waveform. Set the tracking adjustment to the neutral (AUTO) position.</td></tr>
<tr><td colspan="3">Control head phase (X value)<br>

(From drum)<br>Hole<br>Tape<br>Screw (4)<br>Before adjustment, shift fully toward the capstan.<br>Take-up guide pole<br>Screw (5)<br>(To capstan)

<br>Fig. 1-6-5 Control head phase</td><td>1) Play the stairstep portion of the MH-2 Alignment tape.<br>2) See Fig. 1-6-5. Slightly loosen screws (4) and (5). Set the A/C head positioning tool over screw (4) with the pin of the tool inserted into the indicated hole.<br>3) Turn the tool counterclockwise to shift the A/C head fully toward the capstan direction.<br>4) While observing the CH-2 FM waveform, gradually turn the tool clockwise. Stop at the peak output position and tighten screw (5). Remove the tool and tighten screw (4).<br>5) Operate the tracking adjustment and confirm that the maximum FM waveform is obtained at the neutral setting.<br>6) If the FM output peak is not obtained at tracking neutral position, shift the A/C head at the FM output peak nearest to this position.</td></tr>
</table>

| No. | Item | Adjustment parts | Operating mode | Description |
|---|---|---|---|---|
| 4 | Final checks | | | 1) Supply a video or TV signal (monochrome is preferable). Use a spare tape and record and play back. Confirm that the playback FM signal conforms to the parameters indicated in Fig. 1-6-1.<br>2) Perform the checks and, if necessary adjustments, of the Electrical Adjustments Section for the servo, video and audio circuits. |

# SECTION 2
# ELECTRICAL ADJUSTMENTS

## 2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

### 2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Vector scope
5. Audio oscillator
6. Audio voltmeter
7. Digital voltmeter
8. Signal generator: RF/IF sweep/marker
9. Signal generator: PAL color bar, stairstep
10. Signal generator: Audio multiplex TV Signal Generator
11. Recording tape
12. Alignment tape: (MH-2)

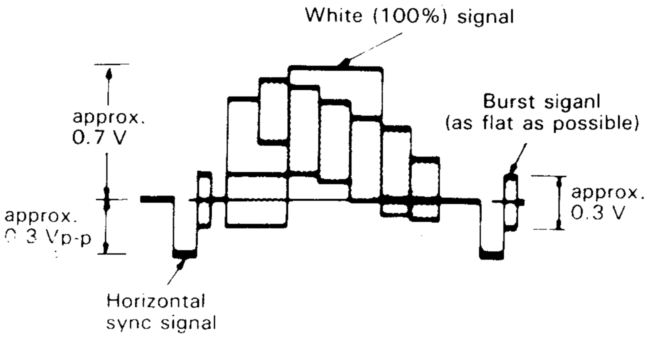

White (100%) signal
Burst siganl
(as flat as possible)
approx.
0.7 V
approx.
0.3 V
approx.
0.3 Vp-p
Horizontal
sync signal

**Fig. 2-1-1** Color bar signal of pattern generator

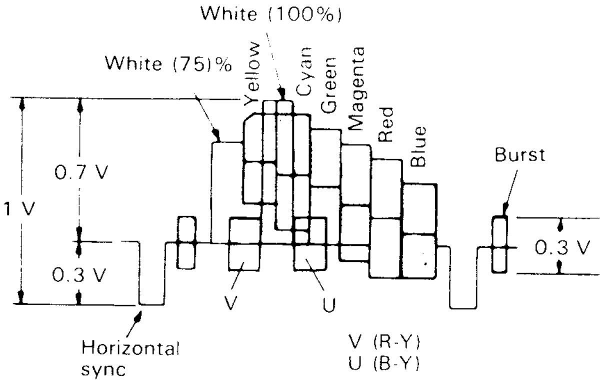

White (100%)
White (75)%
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
0.7 V
1 V
0.3 V
0.3 V
V
U
Horizontal
sync
V (R-Y)
U (B-Y)

**Fig. 2-1-2** Color bar signal waveform

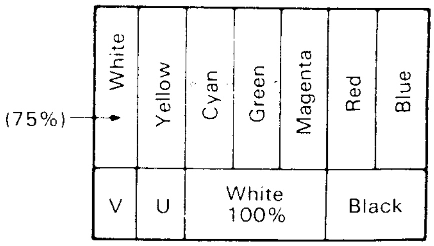

(75%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
V
U
White
100%
Black

**Fig. 2-1-3** Color bar pattern

## 2.2 POWER SUPPLY CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the power supply board.

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Output Voltage | CN-1<br>1 Pin | R9 | POWER ON | 1. Connect digital voltmeter between CN-1 pin 1 and GND.<br>2. Adjust R9 for 15.3 VDC. |

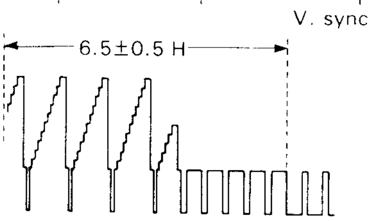
## 2.3 TIMER CIRCUIT

**Note:** Unless otherwise noted, all test points and adjustments are located on the TIMER board.

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Timer clock | TP2 | C10 | • E-E | 1. Connect a frequency counter between TP2 and GND.<br>2. Short between GND and TP3 (TEST), then short the leads of electrolytic capacitor C8 once in order to reset IC1.<br>3. Adjust C10 for 2048.000±0.002 Hz (488.2808 to 488.2818 μs). |

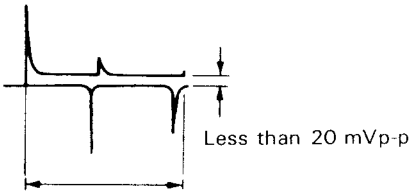
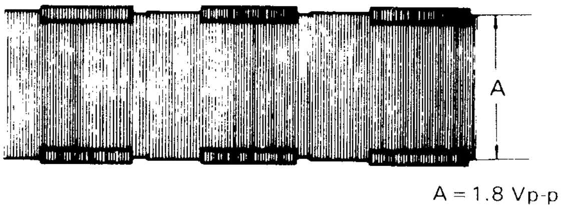
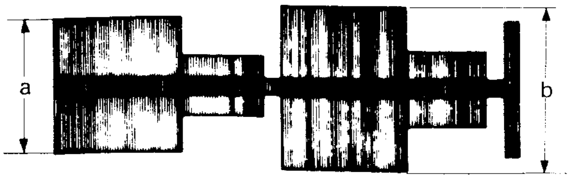
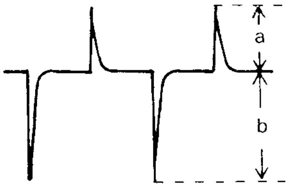
## 2.4 SERVO CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the MAIN board.

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | PB Switching Point | VIDEO OUT | R465 (CH-1) | • PB<br>• MH-2 Stairstep<br>• Trigger slope (−)<br>• SP mode<br><br> <br>**Fig. 2-4-1** | 1. Connect an oscilloscope to VIDEO OUT.<br>2. Play back the stairstep segment of MH-2 alignment tape.<br>3. Trigger the oscilloscope externally (−slope) with the signal from TP411 (DRUM FF).<br>4. Adjust R465 to position the trigger point 6.5 ±0.5 H from V. sync. |
| 2 | Slow Tracking | Monitor | R478 | • Slow PB<br>• SP mode | 1. Set the tracking control of the front panel to the center position by simultaneously pressing the + and − tracking buttons.<br>2. Record a color bar signal in the SP mode, then play back in the Slow mode.<br>3. Adjust R478 to minimize noise bars in the monitor-TV display. |
| 3 | X2 Tracking | Monitor | R414 | • X2 PB<br>• SP mode | 1. Set the tracking control to the center position.<br>2. Play back color bar signal in the double speed play back mode.<br>3. Adjust R414 to minimize noise bars in the monitor TV display. |
| 4 | V. Pulse Position (V. LOCK) | Monitor | R416 | • REC then PB<br>• Still mode<br>• Color bar | 1. Record a color bar signal, then play back in the Still mode.<br>2. Observe the monitor and adjust R416 for minimum vertical jitter. |

## 2.5 VIDEO CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the MAIN board.

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Y NR (NC BAL) | TP121 | R112 | • E-E mode<br>• Color bar | 1. Record, then play back a color bar signal and connect an oscilloscope to TP121.<br>2. As indicated in the figure, adjust R112 for minimum DC step difference. |
| |  <br>Fig. 2-5-1 | | | | |
| 2 | REC FM Level | TP2 (Pre/Rec board) | R204 | • REC mode<br>• Color bar<br>• SP mode | 1. Supply a color bar input signal.<br>2. Connect an oscilloscope to TP3 of the PRE/REC board.<br>3. Adjust R204 so that the pedestal level of the vertical blanking component becomes 1.8 Vp-p.<br>**Note:** Connect oscilloscope ground to the shield cover. |
| |  <br>Fig. 2-5-2 | | | | |
| 3 | SP REC Color Level and Balance | TP304 | R321 | • PB mode<br>• MH-2 color bar<br>• SP mode<br>• REC then PB<br>• Color bar<br>• SP mode | 1. Connect an oscilloscope to TP304. Play back a color bar segment of the MH-2 and observe color signal level.<br>2. Adjust by pressing the + and − tracking buttons of the front panel for maximum level of the color waveform and make a note of the higher color level.<br>3. Set the tracking control of the front panel to the center position by simultaneously pressing the + and − tracking buttons.<br>4. Record and play back a color bar signal. If necessary, before recording, adjust R321 so that the higher level channel becomes 85% of the noted level during playback. At this time, confirm that the channel difference is within 3 dB. |
| |  <br>Fig. 2-5-3 | | | | |
| 4 | SECAM DETECTOR | TP351 | L353 | • SECAM color bar<br>• E-E | 1. Supply a SECAM color bar signal to video IN.<br>2. Connect oscilloscope to TP351.<br>3. Adjust L353 to obtain a:b = 3:4. |
| |  <br>Fig. 2-5-4 | | | | |

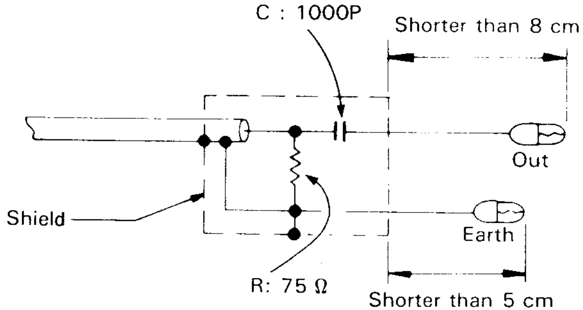
## 2.6 AUDIO CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the AUDIO board.

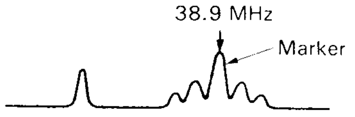
| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | Audio Bias Level | TP31,<br>TP32 | R9 | • SOURCE Select: AUX<br>• SP mode<br>• REC mode<br>• No signal | 1. Connect a millivoltmeter between TP31 and TP32.<br>2. Set for REC mode without signal.<br>3. Adjust R9 for 1.9 mVrms. |
| 2 | Audio PB Level | AUDIO OUT | R28 | • SOURCE Select: AUX<br>• REC then PB<br>• SP or EP mode<br>• −8 dBs/1 kHz | 1. Connect an oscilloscope to AUDIO OUT.<br>2. Supply an audio signal (−8 dBs/1 kHz) to Peri connector and record together with a video signal, then play back.<br>3. Adjust R28 to obtain −6 dBs audio output. |

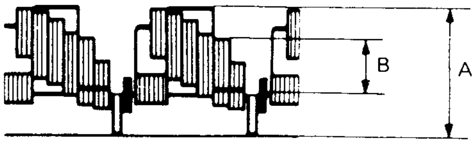
## 2.7 TUNER/IF CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the TUNER/IF board.

<table>
<tr><th>No.</th><th>Item</th><th>Check Point</th><th>Adjustment Parts</th><th>Signal & Mode</th><th>Description</th></tr>
<tr><td colspan="6">**Equipment required:**<br>1. Oscilloscope<br>2. IF sweep signal generator with suitable markers (PIF, SIF, etc.)<br>3. Sweeper probe (sweep signal supply cable) as shown below.<br>

C : 1000P<br>Shorter than 8 cm<br>Out<br>Shield<br>Earth<br>R: 75 Ω<br>Shorter than 5 cm

<br>Fig. 2-7-1<br>Sweeper probe</td></tr>
<tr><td>1</td><td>VCO<br> <br>VCO and sweep signal (beat)<br>Fig. 2-7-2</td><td>IC1-28</td><td>T2 (VCO)</td><td>• Sweep generator out: 70 dBμ (38.9 MHz)<br>• Tuner mode without antenna IN</td><td>1. Use a sweeper probe as shown in Fig. 2-7-1 and connect the sweep generator output to pin 2 of SAW1.<br>Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope.<br>Connect an oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-7-2.</td></tr>
<tr><td>2</td><td>IF Adj.</td><td>IC1-28</td><td>IF Core in Front end</td><td>• Sweep generator out: 70 dBμ (38.9 MHz)<br>• Tuner mode without antenna IN</td><td>1. Use the sweeper probe shown in Fig. 2-7-1 and connect the sweep generator output to TP of the front end (TUNER).<br>2. Connect an oscilloscope to pin 28 of IC1.<br>Adjust IF core of the front end so that the 38.9 MHz marker becomes maximum level.</td></tr>
<tr><td>3</td><td>RF AGC</td><td>IF terminal of Front end</td><td>R21</td><td>• TV signal<br>• Tuner mode</td><td>**• Before the following adjustments:**<br>1. Connect a cable to ANT IN and terminate TV OUT a 75 Ω.<br>2. Set a TV channel signal generator as follows.<br>Video : 65 dBμ/75 Ω, color bar 87.5% modulation.<br>Audio : 55 dBμ/75 Ω, 1 kHz±50 kHz deviation<br>1. Connect an oscilloscope to IF terminal of U/V Tuner (front end). Adjust R21 for maximum level, then again adjust R21 for −5 dB again.</td></tr>
</table>

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 4 | Color Level | JP1-12 (VIDEO OUT) | R40 | • TV signal<br>• Tuner mode<br>• Color bar | 1. Receive a color bar signal. Set the Y level for 100% reference signal and then adjust R40 for a magenta level of 48% at video out. |
| |  <br>B: magenta A:B = 1:0.48<br>Fig. 2-7-3 | | | | |

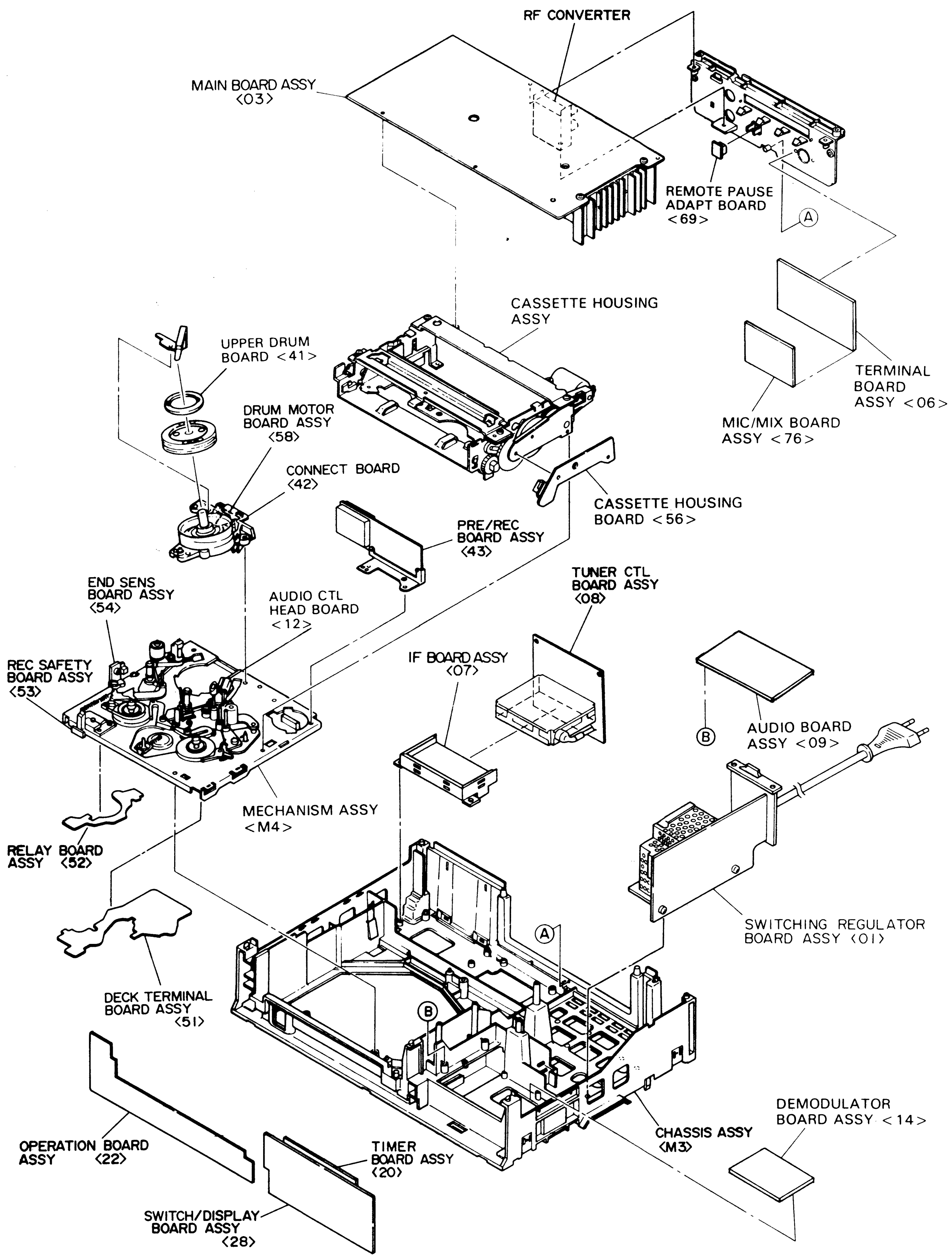
## 2.8 DEMODULATOR CIRCUIT

**Note:** Unless otherwise specified, all test points and adjustments are located on the DEMODULATOR board.

| No. | Item | Check Point | Adjustment Parts | Signal & Mode | Description |
|---|---|---|---|---|---|
| 1 | First audio detector coil | 3 Pin of IC1 | T4 (IF PWB) | • BILING mode<br>• SUB: unmod.<br>• MAIN: mod. | 1. Apply Main audio modulated signal to the front end IF terminal.<br>2. Connect distortion meter to IC1 pin 3.<br>3. Adjust T4 of the IF board for minimum distortion.<br>**Note:** Audio multiplex TV Signal generator connection is the same for the following adjustments. |
| 2 | Second audio detector coil | 2 Pin of IC1 | T1 | • BILING mode<br>• SUB: mod.<br>• MAIN: unmod. | 1. Connect distortion meter to IC1 pin 3.<br>2. Adjust T1 of the IF board for minimum distortion. |
| 3. | Stereo separation | 5 Pin of IC1 | R2 | • STEREO mode<br>• R: mod.<br>• L: unmod. | 1. Set signal generator to Stereo mode, but adjust only the R channel.<br>2. Connect oscilloscope to IC1 pin 5.<br>3. Adjust R2 for minimum output. |
| 4 | Buzz | CN2 Pin 2 | T8, T2 (IF PWB) | • STEREO mode<br>• R/L unmod. | 1. Connect noise meter to CN2 pin 2.<br>2. Adjust IF board T8 for minimum Philips pattern noise.<br>3. Adjust IF board T2 for minimum crosshatch noise. |
| 5 | Audio output level | CN2-2 Pin (L)<br>CN2-4 (R) | R21 (L)<br>R24 (R) | • STEREO mode<br>• R mod./unmod.<br>• L unmod./mod. | 1. Set signal generator to Stereo mode.<br>2. Connect audio meter to CN2 pin 2.<br>3. Adjust R21 (L channel) for − 18.0 dBs.<br>4. Similarly, connect audio meter to CN2 pin 4 and adjust R24 for the R channel. |

# SECTION 3
# CHARTS AND DIAGRAMS

## 3.1 CIRCUIT BOARD LOCATIONS

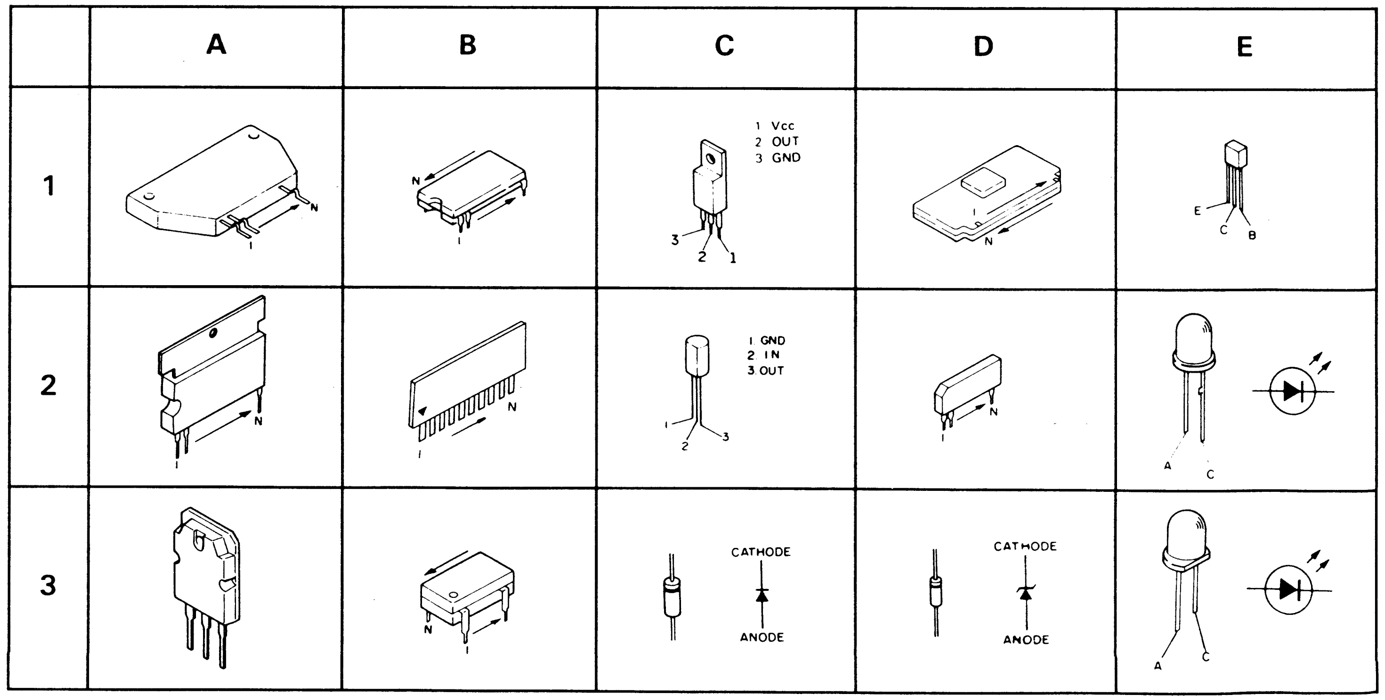

RF CONVERTER
MAIN BOARD ASSY <03>
REMOTE PAUSE ADAPT BOARD <69>
Ⓐ
CASSETTE HOUSING ASSY
UPPER DRUM BOARD <41>
DRUM MOTOR BOARD ASSY <58>
CONNECT BOARD <42>
TERMINAL BOARD ASSY <06>
MIC/MIX BOARD ASSY <76>
CASSETTE HOUSING BOARD <56>
PRE/REC BOARD ASSY <43>
END SENS BOARD ASSY <54>
AUDIO CTL HEAD BOARD <12>
TUNER CTL BOARD ASSY <08>
REC SAFETY BOARD ASSY <53>
IF BOARD ASSY <07>
Ⓑ
AUDIO BOARD ASSY <09>
MECHANISM ASSY <M4>
RELAY BOARD ASSY <52>
SWITCHING REGULATOR BOARD ASSY <01>
Ⓐ
DECK TERMINAL BOARD ASSY <51>
Ⓑ
DEMODULATOR BOARD ASSY <14>
CHASSIS ASSY <M3>
OPERATION BOARD ASSY <22>
TIMER BOARD ASSY <20>
SWITCH/DISPLAY BOARD ASSY <28>

## 3.2 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUITS

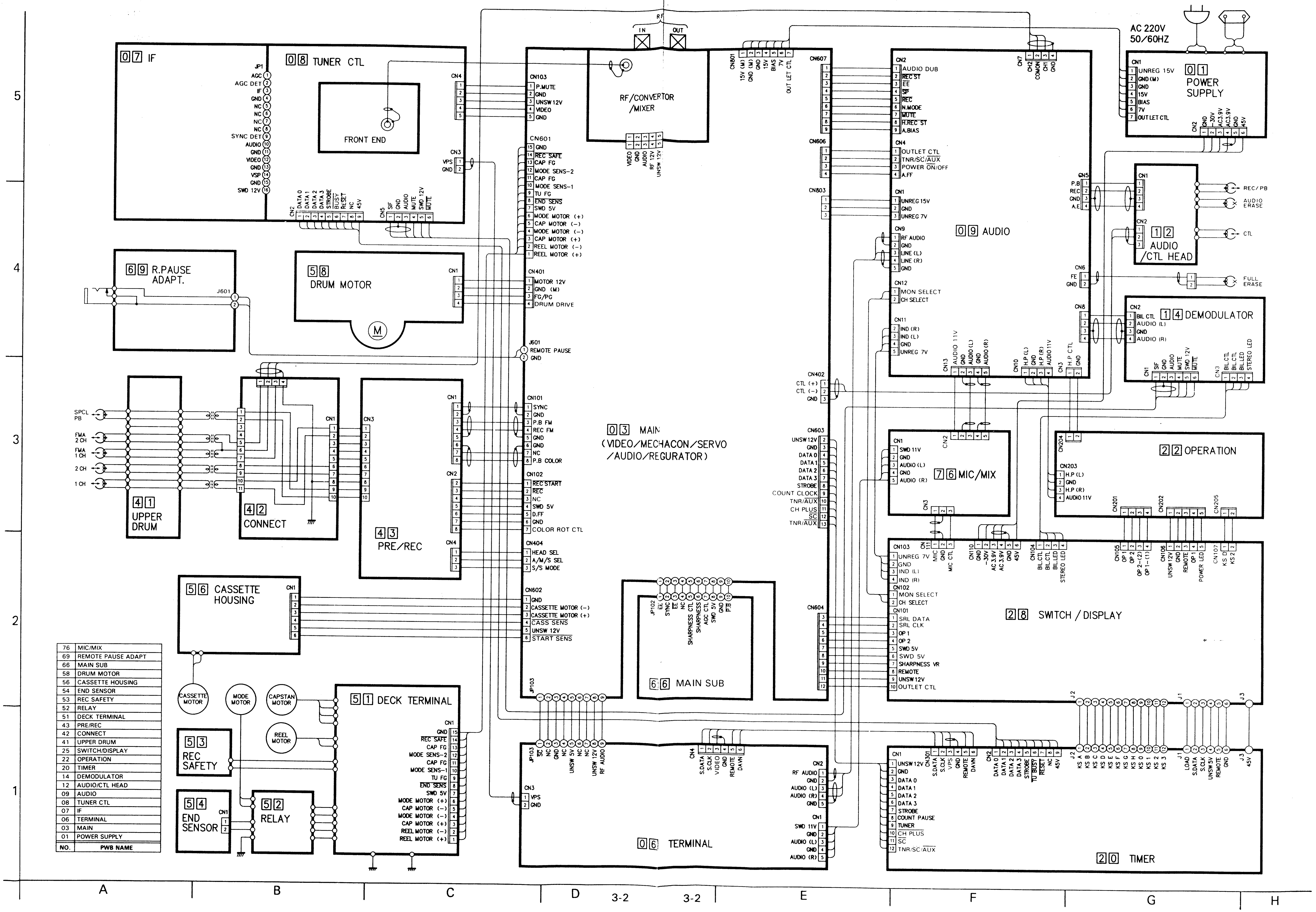
| INTEGRATED CIRCUIT | |
|---|---|
| NAME | L |
| BA6222 | 2A |
| BA7106LS | 2B |
| BU4069UB | 1B |
| BX6385 | 2B |
| HA118019NT | 1B |
| HD49722NT | 3B |
| LA7222 | |
| MC7805ACT | 1C |
| MSC7112-01SS | 1B |
| MSM16811RS | 3B |
| M50445-398SP | 1B |
| M50965-367SP | 1B |
| PB20166G | 1C |
| PB20167A-01 | 1C |
| PB20277A | 1D |
| PU60764 | |
| SDA5642 | 1B |
| STK5490 | 1A |
| STR10006 | 3A |
| S-8053HNB | 2C |
| TA8405S | 2D |
| UPD75216ACW-163 | 1B |

| TRANSISTOR | |
|---|---|
| NAME | L |
| DTC144ES | 1E |
| 2SD1764 | |
| 2SK658 | 1E |

| DIODE | |
|---|---|
| NAME | L |
| HZS39EB4TJ | 3D |
| HZ12A2 | 4E |
| SL-R34MC3F | 2E |
| PU1A | |
| SLR-55DC3F | 3E |
| SLR-55VC3F | 3E |
| 10E6 | 3C |

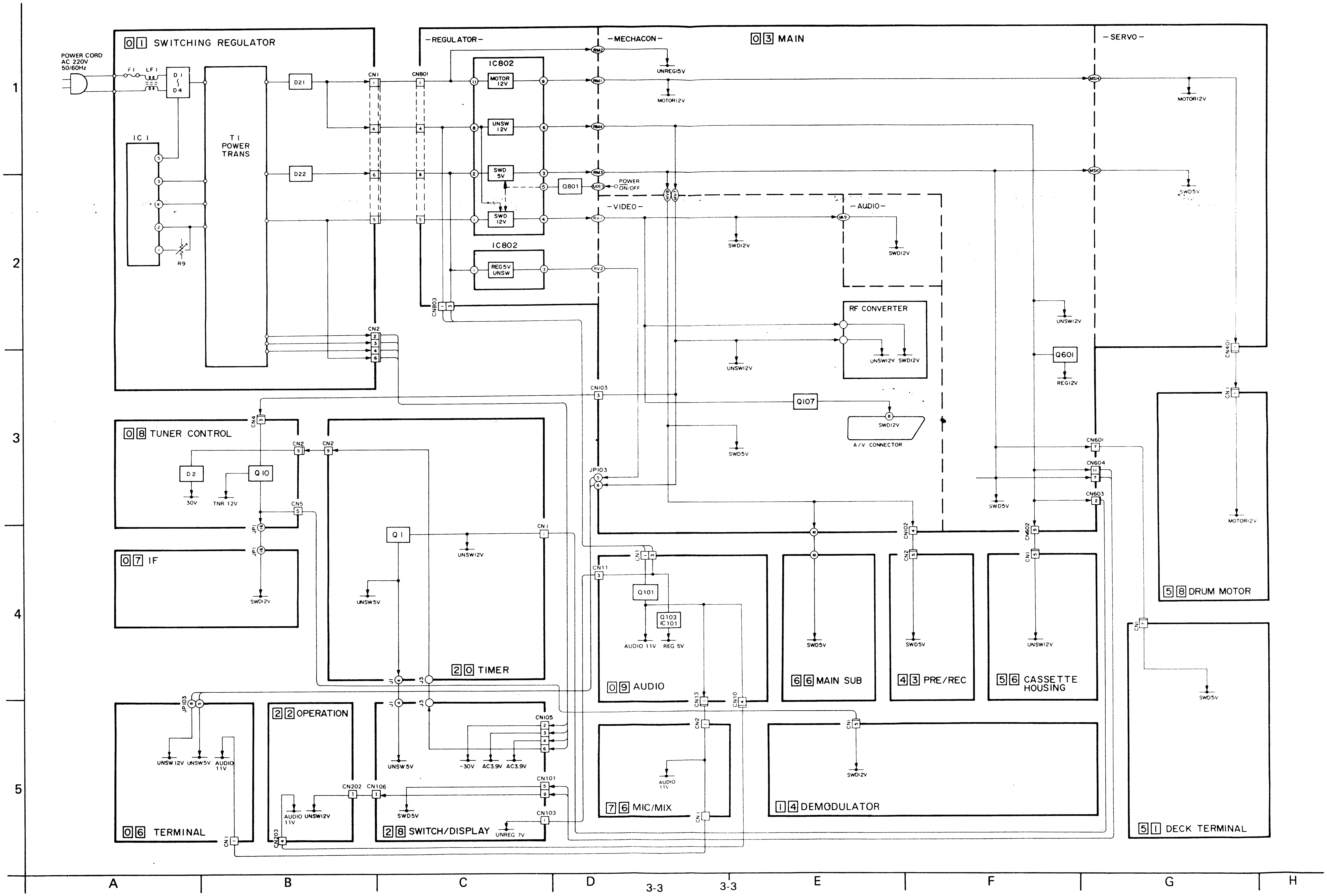

A
B
C
D
E
1
2
3
N
1
N
1
1 Vcc
2 OUT
3 GND
3
2
1
1
N
E
C
B
N
1
N
1
1 GND
2 IN
3 OUT
1
2
3
1
N
A
C
N
1
CATHODE
ANODE
CATHODE
ANODE
A
C

## 3.3 BOARD INTERCONNECTION DIAGRAM

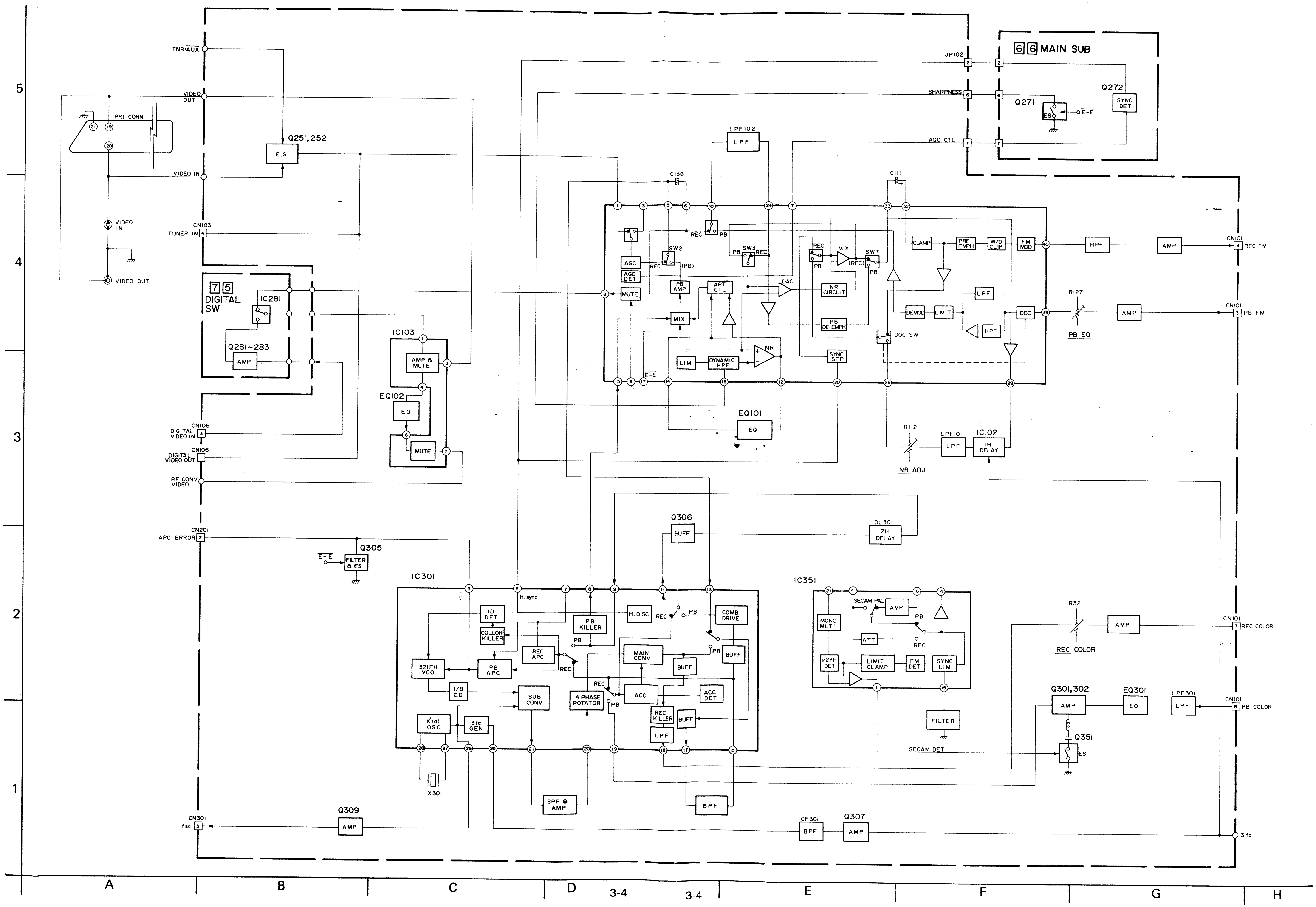

07 IF
JP1
AGC
AGC DET
IF
GND
NC
SYNC DET
AUDIO
VIDEO
VSP
SWD 12V
08 TUNER CTL
FRONT END
CN4
CN3
VPS
CN2
DATA 0
DATA 1
DATA 2
DATA 3
STROBE
BUSY
RESET
NC
45V
CN5
SIF
MUTE
69 R.PAUSE ADAPT.
J601
58 DRUM MOTOR
CN1
M
41 UPPER DRUM
SPCL PB
FMA 2 CH
FMA 1 CH
2 CH
1 CH
42 CONNECT
43 PRE/REC
56 CASSETTE HOUSING
CASSETTE MOTOR
MODE MOTOR
CAPSTAN MOTOR
REEL MOTOR
53 REC SAFETY
54 END SENSOR
52 RELAY
51 DECK TERMINAL
RF
IN
OUT
RF/CONVERTOR /MIXER
VIDEO
GND
AUDIO
RF 12V
UNSW 12V
CN103
P.MUTE
UNSW 12V
CN601
REC SAFE
CAP FG
MODE SENS-2
MODE SENS-1
TU FG
END SENS
SWD 5V
MODE MOTOR (+)
CAP MOTOR (-)
MODE MOTOR (-)
CAP MOTOR (+)
REEL MOTOR (-)
REEL MOTOR (+)
CN401
MOTOR 12V
GND (M)
FG/PG
DRUM DRIVE
J601
REMOTE PAUSE
CN101
SYNC
P.B FM
REC FM
P.B COLOR
CN102
REC START
REC
D.FF
COLOR ROT CTL
CN404
HEAD SEL
A/M/S SEL
S/S MODE
CN602
CASSETTE MOTOR (-)
CASSETTE MOTOR (+)
CASS SENS
START SENS
JP103
03 MAIN
(VIDEO/MECHACON/SERVO /AUDIO/REGURATOR)
66 MAIN SUB
JP102
EE
SYNC
SHARPNESS CTL
SHARPNESS
AGC CTL
P.B
CN801
15V (M)
GND (M)
15V
BIAS
7V
OUT LET CTL
CN607
CN606
CN803
CN402
CTL (+)
CTL (-)
CN603
UNSW 12V
COUNT CLOCK
TNR/AUX
CH PLUS
SC
CN604
06 TERMINAL
S.DATA
S.CLK
REMOTE
DAVN
RF AUDIO
AUDIO (L)
AUDIO (R)
SWD 11V
09 AUDIO
AUDIO DUB
REC ST
EE
SP
N.MODE
MUTE
H.REC ST
A.BIAS
OUTLET CTL
TNR/SC/AUX
POWER ON/OFF
A.FF
UNREG 15V
UNREG 7V
RF AUDIO
LINE (L)
LINE (R)
MON SELECT
CH SELECT
IND (R)
IND (L)
CN7
CH2
COMON
CH1
CN5
P.B
A.E
CN6
FE
CN8
CN13
AUDIO 11V
CN10
H.P (L)
H.P (R)
H.P CTL
AC 220V 50/60HZ
01 POWER SUPPLY
UNREG 15V
GND (M)
15V
BIAS
7V
OUT LET CTL
-30V
AC3.9V
45V
12 AUDIO /CTL HEAD
REC/PB
AUDIO ERASE
CTL
FULL ERASE
14 DEMODULATOR
BIL CTL
BIL LED
STEREO LED
76 MIC/MIX
MIC
MIC CTL
22 OPERATION
CN204
CN203
CN201
CN202
CN205
28 SWITCH / DISPLAY
CN110
CN104
CN105
OP 1
OP 2
CN106
POWER LED
CN107
KS D
KS 2
SRL DATA
SRL CLK
SHARPNESS VR
OUTLET CTL
20 TIMER
CN301
CN2
COUNT PAUSE
TUNER
J2
KS A
KS B
KS C
KS D
KS E
KS F
KS G
KS H
KS 0
KS 1
KS 2
KS 3
J1
LOAD
UNSW 5V
J3
1
2
3
4
5
A
B
C
D
E
F
G
H

| NO. | PWB NAME |
|---|---|
| 76 | MIC/MIX |
| 69 | REMOTE PAUSE ADAPT |
| 66 | MAIN SUB |
| 58 | DRUM MOTOR |
| 56 | CASSETTE HOUSING |
| 54 | END SENSOR |
| 53 | REC SAFETY |
| 52 | RELAY |
| 51 | DECK TERMINAL |
| 43 | PRE/REC |
| 42 | CONNECT |
| 41 | UPPER DRUM |
| 25 | SWITCH/DISPLAY |
| 22 | OPERATION |
| 20 | TIMER |
| 14 | DEMODULATOR |
| 12 | AUDIO/CTL HEAD |
| 09 | AUDIO |
| 08 | TUNER CTL |
| 07 | IF |
| 06 | TERMINAL |
| 03 | MAIN |
| 01 | POWER SUPPLY |

## 3.4 POWER SYSTEM BLOCK DIAGRAM

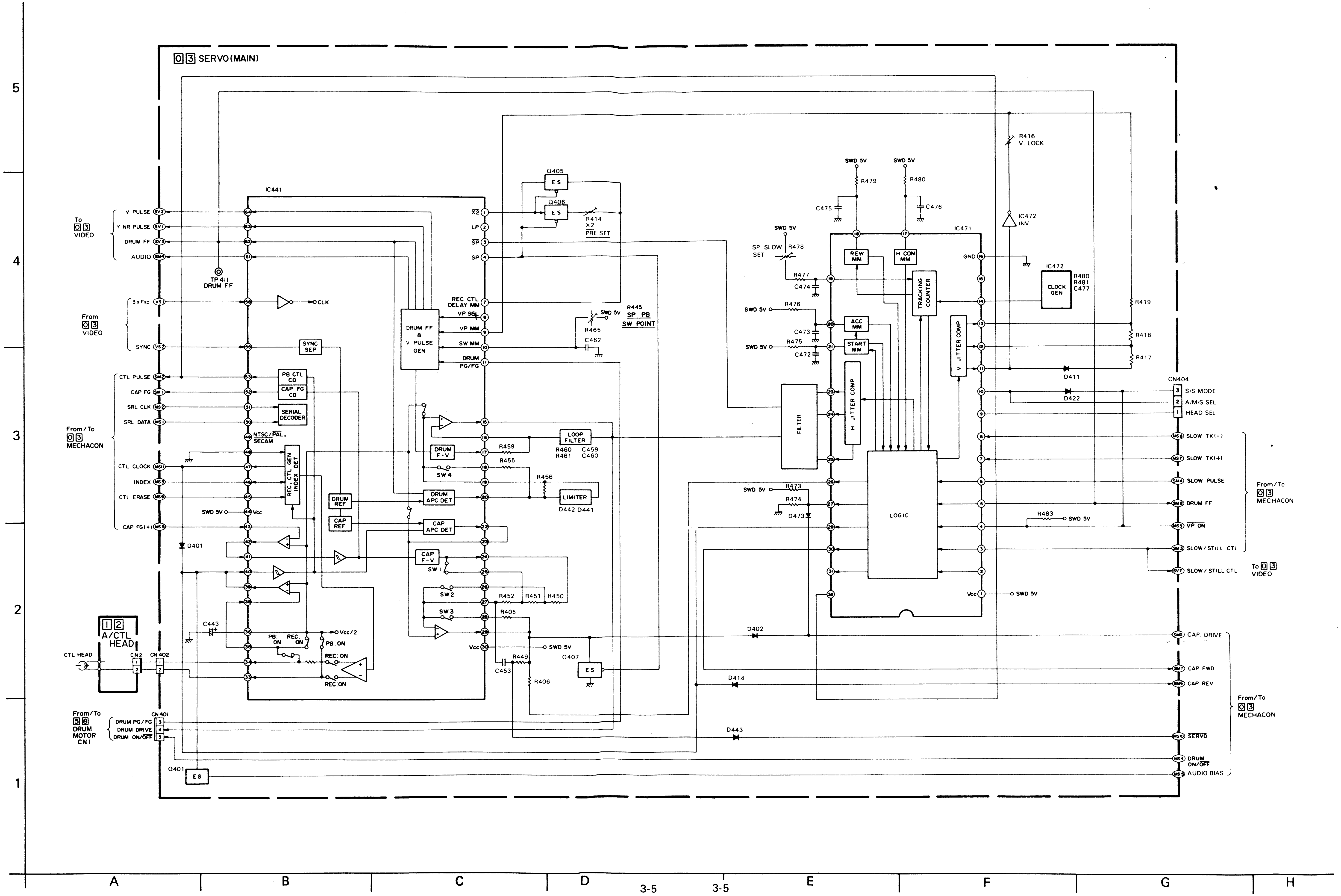

POWER CORD
AC 220V
50/60Hz
F1
LF1
D1
D4
01 SWITCHING REGULATOR
IC1
T1
POWER
TRANS
R9
D21
D22
CN1
CN2
CN801
CN803
-REGULATOR-
IC802
MOTOR 12V
UNSW 12V
SWD 5V
SWD 12V
REG5V UNSW
Q801
POWER ON/OFF
-MECHACON-
UNREG15V
MOTOR12V
03 MAIN
-VIDEO-
-AUDIO-
SWD12V
RF CONVERTER
UNSW12V
Q107
A/V CONNECTOR
SWD5V
-SERVO-
Q601
REG12V
CN401
CN601
CN604
CN603
CN602
CN102
CN103
JP103
08 TUNER CONTROL
CN4
CN5
D2
Q10
30V
TNR 12V
JP1
07 IF
20 TIMER
Q1
UNSW5V
J1
J3
CN11
Q101
Q103
IC101
AUDIO 11V
REG 5V
09 AUDIO
CN13
CN10
66 MAIN SUB
43 PRE/REC
56 CASSETTE HOUSING
58 DRUM MOTOR
51 DECK TERMINAL
06 TERMINAL
UNSW12V
AUDIO 11V
22 OPERATION
CN202
CN203
CN106
CN105
-30V
AC3.9V
CN101
28 SWITCH/DISPLAY
UNREG 7V
76 MIC/MIX
14 DEMODULATOR
1
2
3
4
5
A
B
C
D
E
F
G
H

## 3.5 VIDEO BLOCK DIAGRAM

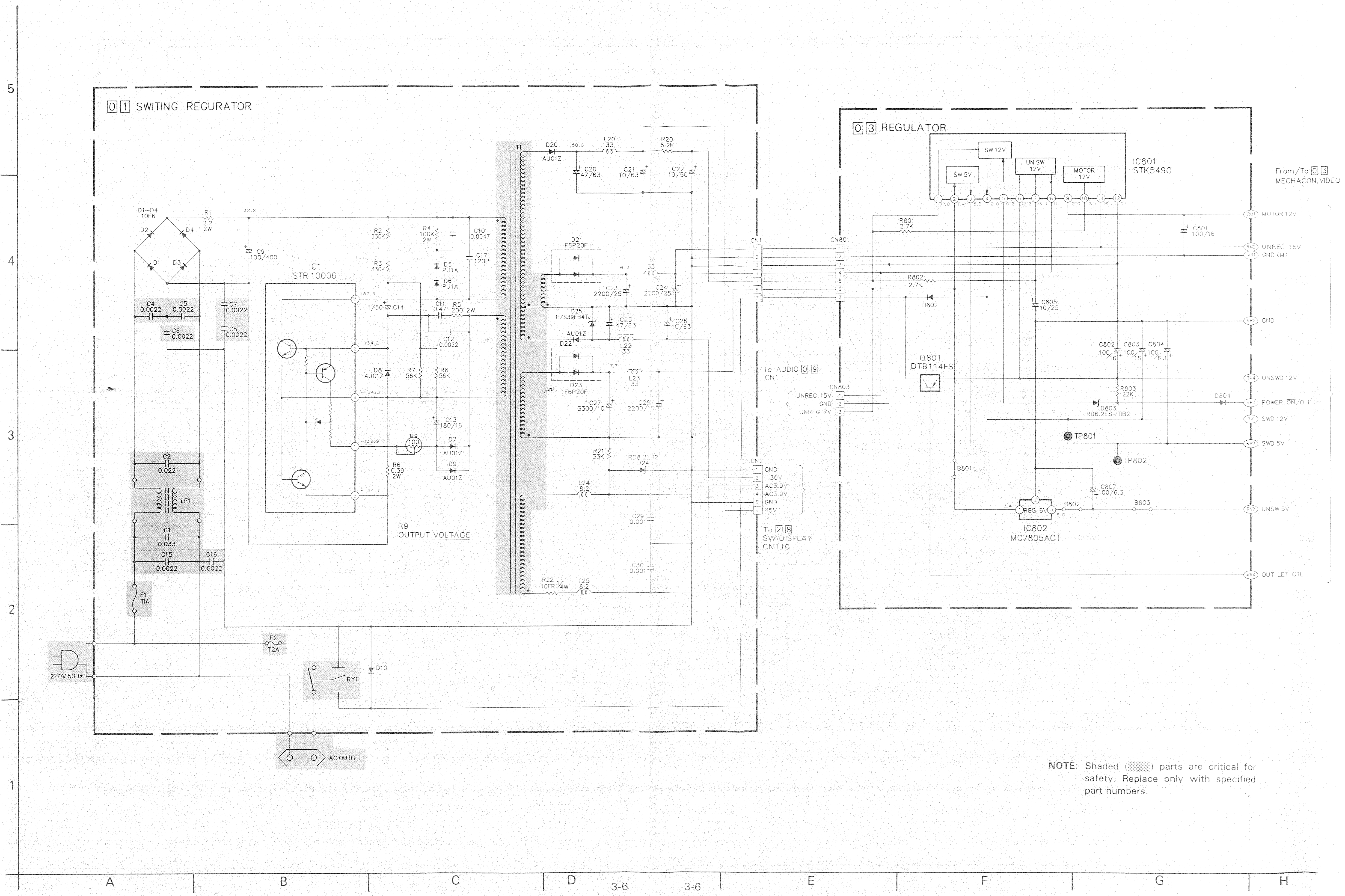


TNR/AUX
VIDEO OUT
PRI CONN
21
19
20
Q251, 252
E.S
VIDEO IN
VIDEO IN
VIDEO OUT
CN103 TUNER IN 4
75 DIGITAL SW
IC281
Q281~283
AMP
CN106 DIGITAL VIDEO IN 3
CN106 DIGITAL VIDEO OUT 1
RF CONV VIDEO
IC103
AMP & MUTE
EQ102
EQ
MUTE
LPF102
LPF
C136
C111
AGC
AGC DET
MUTE
SW2
REC
(PB)
PB AMP
APT CTL
MIX
SW3
PB
REC
DAC
NR CIRCUIT
PB DE-EMPH
MIX
(REC)
SW7
CLAMP
PRE-EMPH
W/D CLIP
FM MOD
DEMOD
LIMIT
LPF
HPF
DOC
DOC SW
LIM
DYNAMIC HPF
NR
SYNC SEP
E-E
EQ101
EQ
JP102
SHARPNESS
AGC CTL
66 MAIN SUB
Q271
ES
E-E
Q272
SYNC DET
HPF
AMP
CN101 4 REC FM
R127
PB EQ
AMP
CN101 3 PB FM
R112
NR ADJ
LPF101
LPF
IC102
1H DELAY
Q306
BUFF
DL301
2H DELAY
CN201 APC ERROR 2
E-E
Q305
FILTER & ES
IC301
H. sync
ID DET
COLLOR KILLER
PB KILLER
H. DISC
REC
PB
COMB DRIVE
REC APC
PB APC
MAIN CONV
BUFF
BUFF
321FH VCO
1/8 C.D.
SUB CONV
4 PHASE ROTATOR
ACC
ACC DET
REC KILLER
BUFF
LPF
X'tal OSC
3fc GEN
X301
BPF & AMP
BPF
IC351
SECAM PAL
AMP
MONO MLTI
ATT
1/2 fH DET
LIMIT CLAMP
FM DET
SYNC LIM
FILTER
SECAM DET
R321
REC COLOR
AMP
CN101 7 REC COLOR
Q301, 302
AMP
EQ301
EQ
LPF301
LPF
CN101 8 PB COLOR
Q351
ES
CN301 fsc 5
Q309
AMP
CF301
BPF
Q307
AMP
3fc
1
2
3
4
5
A
B
C
D
E
F
G
H

## 3.6 SERVO BLOCK DIAGRAM


03 SERVO(MAIN)
IC441
IC471
IC472
To 03 VIDEO
V PULSE SV2
Y NR PULSE SV1
DRUM FF SV3
AUDIO SM4
TP411 DRUM FF
From 03 VIDEO
3×Fsc VS1
SYNC VS2
CLK
SYNC SEP
From/To 03 MECHACON
CTL PULSE SM2
CAP FG SM1
SRL CLK MS2
SRL DATA MS1
CTL CLOCK MS11
INDEX MS3
CTL ERASE MS8
CAP FG(+) MS5
PB CTL CD
CAP FG CD
SERIAL DECODER
NTSC/PAL, SECAM
REC. CTL GEN INDEX DET
DRUM REF
CAP REF
SWD 5V
Vcc
D401
C443
PB: ON
REC: ON
PB: ON
REC: ON
REC: ON
Vcc/2
12 A/CTL HEAD
CTL HEAD
CN2
CN402
From/To 58 DRUM MOTOR CN1
CN401
DRUM PG/FG
DRUM DRIVE
DRUM ON/OFF
Q401
ES
DRUM FF & V PULSE GEN
X2
LP
SP
SP
REC CTL DELAY MM
VP SEL
VP MM
SW MM
DRUM PG/FG
DRUM F-V
DRUM APC DET
CAP APC DET
CAP F-V
SW 1
SW 2
SW 3
SW 4
R459
R455
R456
LOOP FILTER
R460 C459
R461 C460
LIMITER
D442 D441
R452 R451 R450
R405
SWD 5V
C453
R449
R406
Q407
ES
Q405
Q406
ES
R414 X2 PRE SET
R445 SP PB SW POINT
R465
C462
SWD 5V
SP. SLOW SET
R478
R477
C474
R476
C473
R475
C472
C475
C476
R479
R480
REW MM
H COM MM
ACC MM
START MM
TRACKING COUNTER
V JITTER COMP
H JITTER COMP
FILTER
LOGIC
CLOCK GEN
R480 R481 C477
GND
R416 V. LOCK
IC472 INV
R419
R418
R417
D411
D422
R473
R474
D473
R483
SWD 5V
D402
D414
D443
CN404
S/S MODE
A/M/S SEL
HEAD SEL
SLOW TK(−) MS8
SLOW TK(+) MS7
SLOW PULSE SM4
DRUM FF SM8
VP ON SM3
SLOW/STILL CTL SM3
SLOW/STILL CTL SV7
From/To 03 MECHACON
To 03 VIDEO
CAP. DRIVE SM5
CAP FWD SM7
CAP REV SM6
SERVO MS10
DRUM ON/OFF MS4
AUDIO BIAS MS9
From/To 03 MECHACON
1
2
3
4
5
A
B
C
D
E
F
G
H

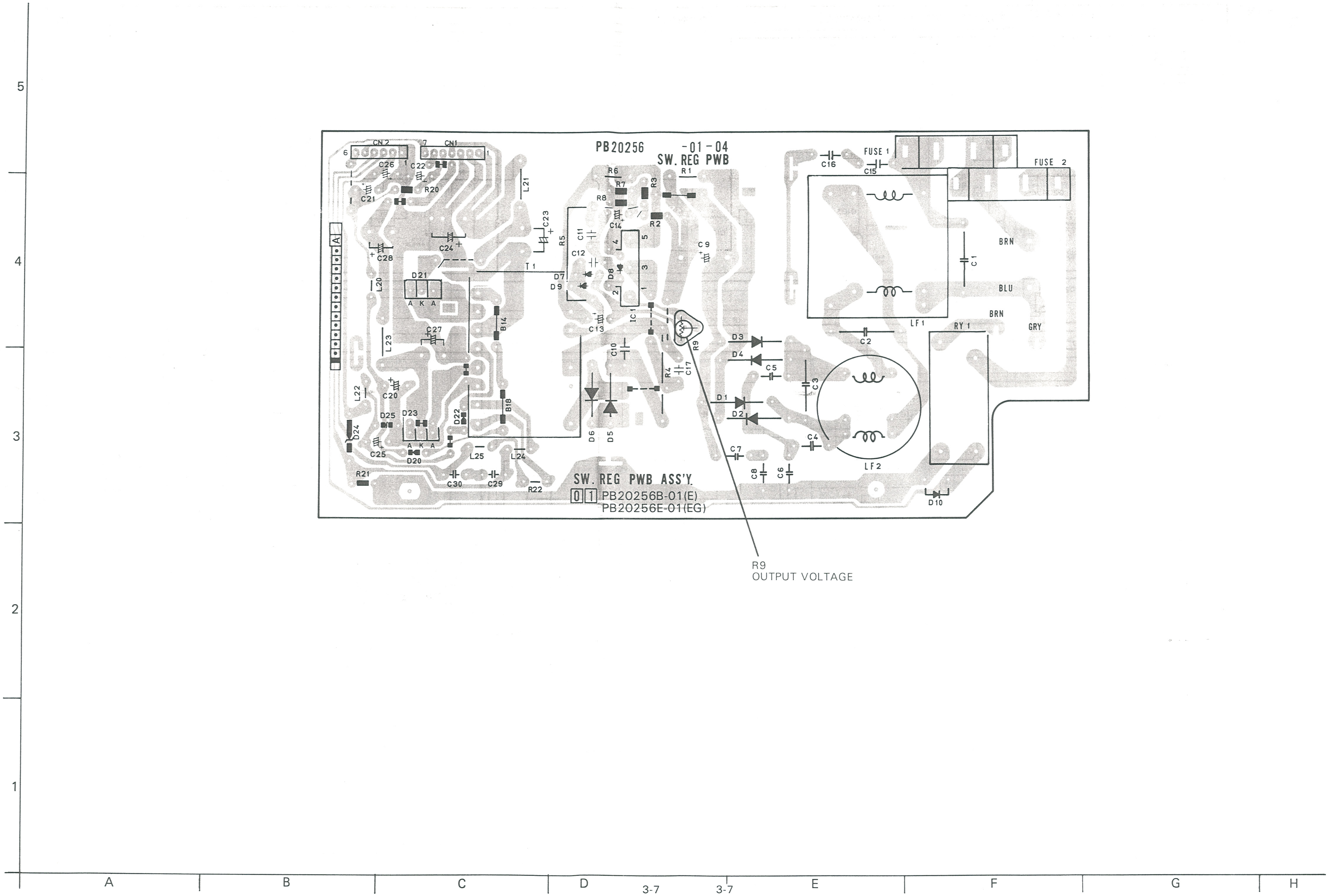
## 3.7 POWER SUPPLY SCHEMATIC DIAGRAMS



01 SWITING REGURATOR
03 REGULATOR
D1~D4 10E6
D2
D4
D1
D3
R1 2.2 2W
C9 100/400
IC1 STR 10006
C4 0.0022
C5 0.0022
C6 0.0022
C7 0.0022
C8 0.0022
C2 0.022
LF1
C1 0.033
C15 0.0022
C16 0.0022
F1 TIA
220V 50Hz
F2 T2A
RY1
D10
AC OUTLET
R2 330K
R3 330K
R4 100K 2W
C10 0.0047
C17 120P
D5 PU1A
D6 PU1A
C14 1/50
C11 0.47
R5 200 2W
C12 0.0022
D8 AU01Z
R7 56K
R8 56K
C13 180/16
R9 100
D7 AU01Z
D9 AU01Z
R6 0.39 2W
R9 OUTPUT VOLTAGE
T1
D20 AU01Z
L20 33
R20 8.2K
C20 47/63
C21 10/63
C22 10/50
D21 F6P20F
L21 33
C23 2200/25
C24 2200/25
D25 HZS39EB4TJ
C25 47/63
C26 10/63
AU01Z
D22
L22 33
L23 33
D23 F6P20F
C27 3300/10
C28 2200/10
R21 33K
RD8.2EB2 D24
L24 8.2
C29 0.001
C30 0.001
R22 10FR 1/4W
L25 8.2
CN1
CN2
GND
-30V
AC3.9V
AC3.9V
GND
45V
To AUDIO 09 CN1
To 28 SW/DISPLAY CN110
CN801
CN803
UNREG 15V
GND
UNREG 7V
SW 12V
SW 5V
UN SW 12V
MOTOR 12V
IC801 STK5490
From/To 03 MECHACON, VIDEO
R801 2.7K
R802 2.7K
D802
C801 100/16
C805 10/25
C802 100/16
C803 100/16
C804 100/6.3
Q801 DTB114ES
R803 22K
D803 RD6.2ES-TIB2
D804
TP801
TP802
B801
C807 100/6.3
B802
B803
REG 5V
IC802 MC7805ACT
MOTOR 12V
UNREG 15V
GND (M)
GND
UNSWD 12V
POWER ON/OFF
SWD 12V
SWD 5V
UNSW 5V
OUT LET CTL
1
2
3
4
5
A
B
C
D
E
F
G
H

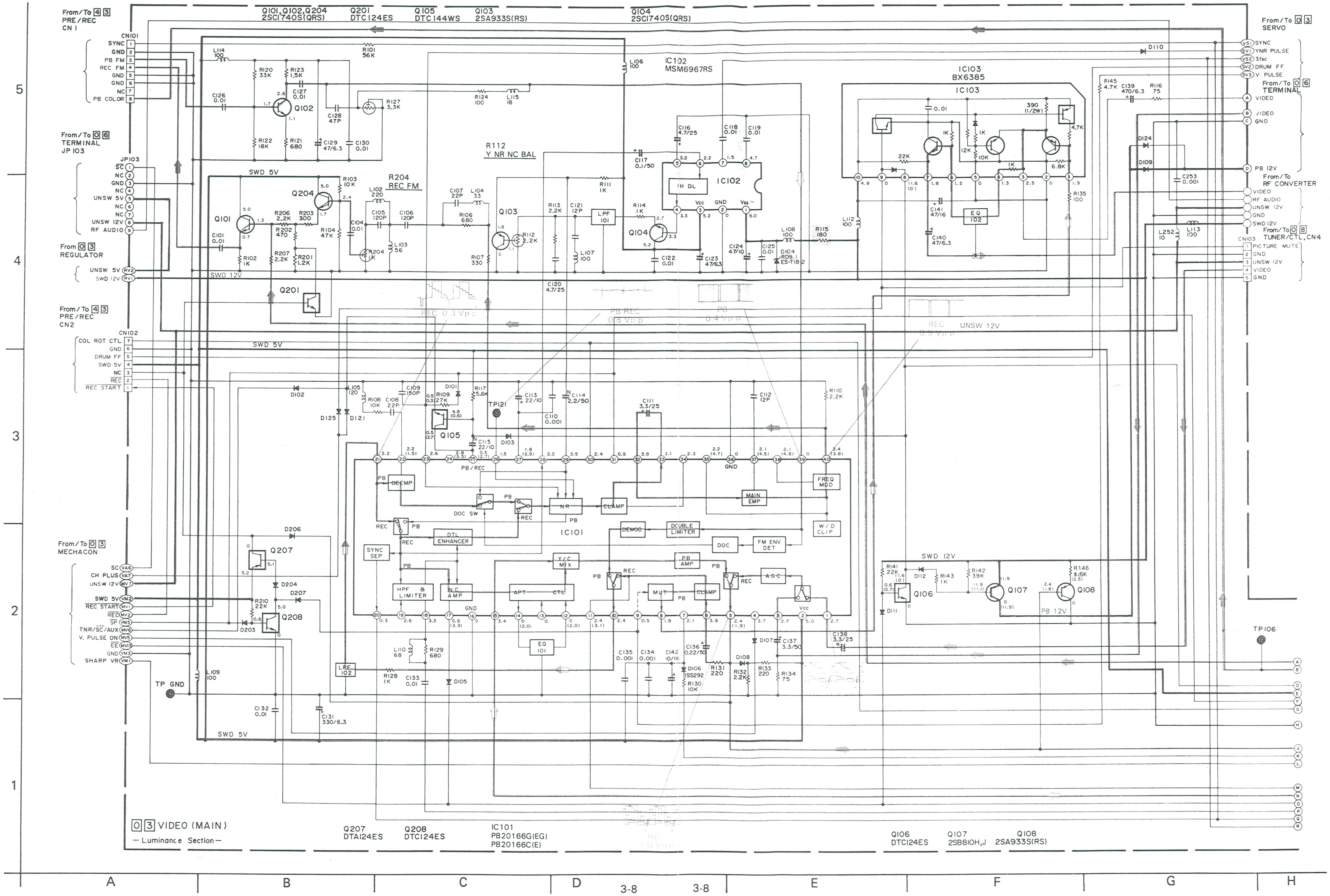
**NOTE:** Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

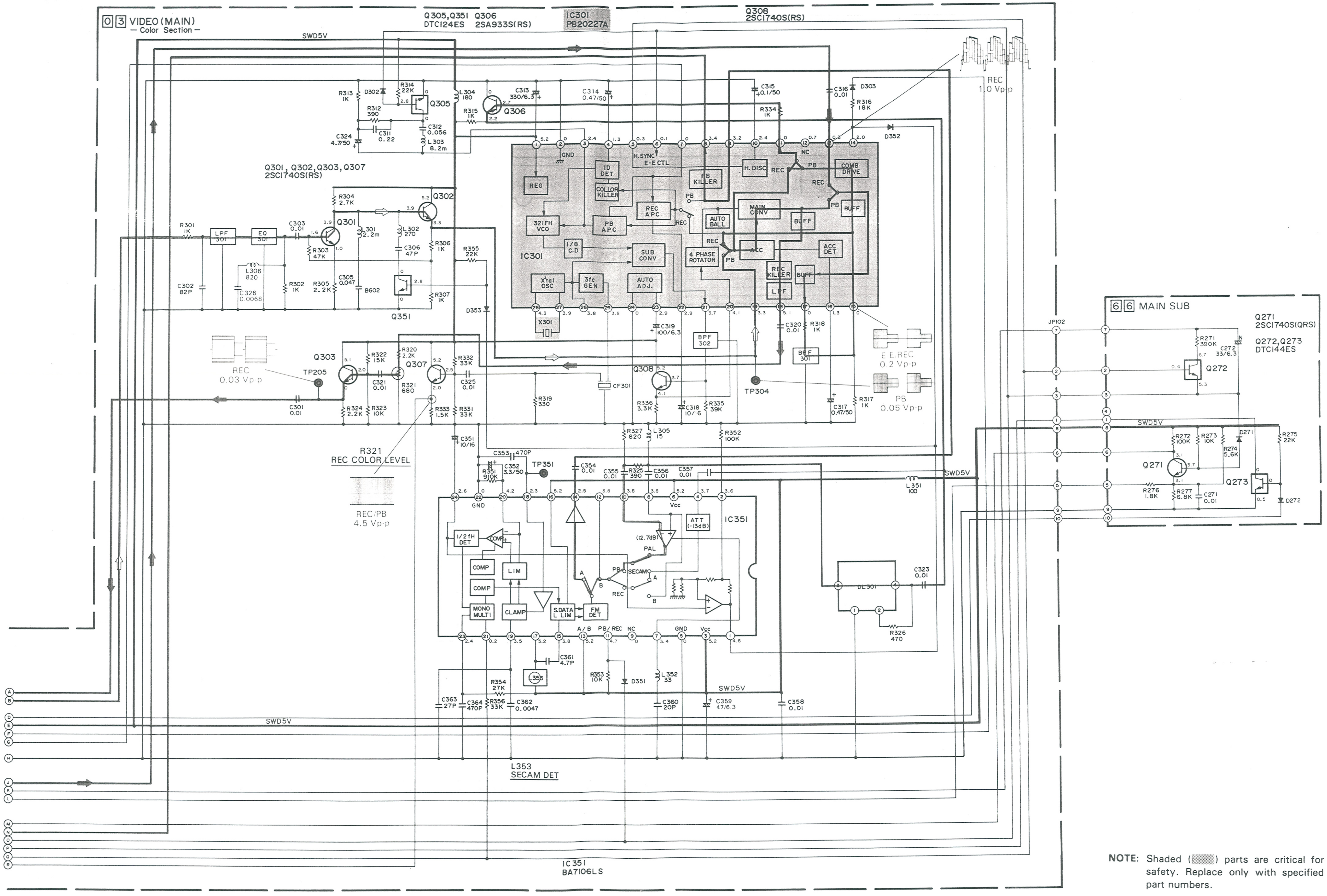
## 3.8 SWITCHING REGULATOR CIRCUIT BOARD


PB20256 -01-04
SW. REG PWB
SW. REG PWB ASS'Y.
01 PB20256B-01(E)
PB20256E-01(EG)
R9
OUTPUT VOLTAGE
CN2
CN1
6
7
1
A
C26
C22
C21
R20
C28
C24
C23
L21
L20
D21
A K A
T1
B14
C27
L23
L22
C20
D25
D23
D22
B18
D24
C25
D20
A K A
L25
L24
R21
C30
C29
R22
R6
R7
R8
R3
R1
R2
C14
C11
R5
C12
D7
D9
D8
C9
IC1
C13
C10
R4
C17
D6
D5
FUSE 1
FUSE 2
C16
C15
BRN
BLU
BRN
GRY
C1
LF1
RY1
C2
D3
D4
C5
C3
D1
D2
C4
LF2
C7
C8
C6
D10
5
4
3
2
1
A
B
C
D
E
F
G
H

## 3.9 VIDEO SCHEMATIC DIAGRAM

**NOTE:** Shaded (▒) parts are critical for safety. Replace only with specified part numbers.

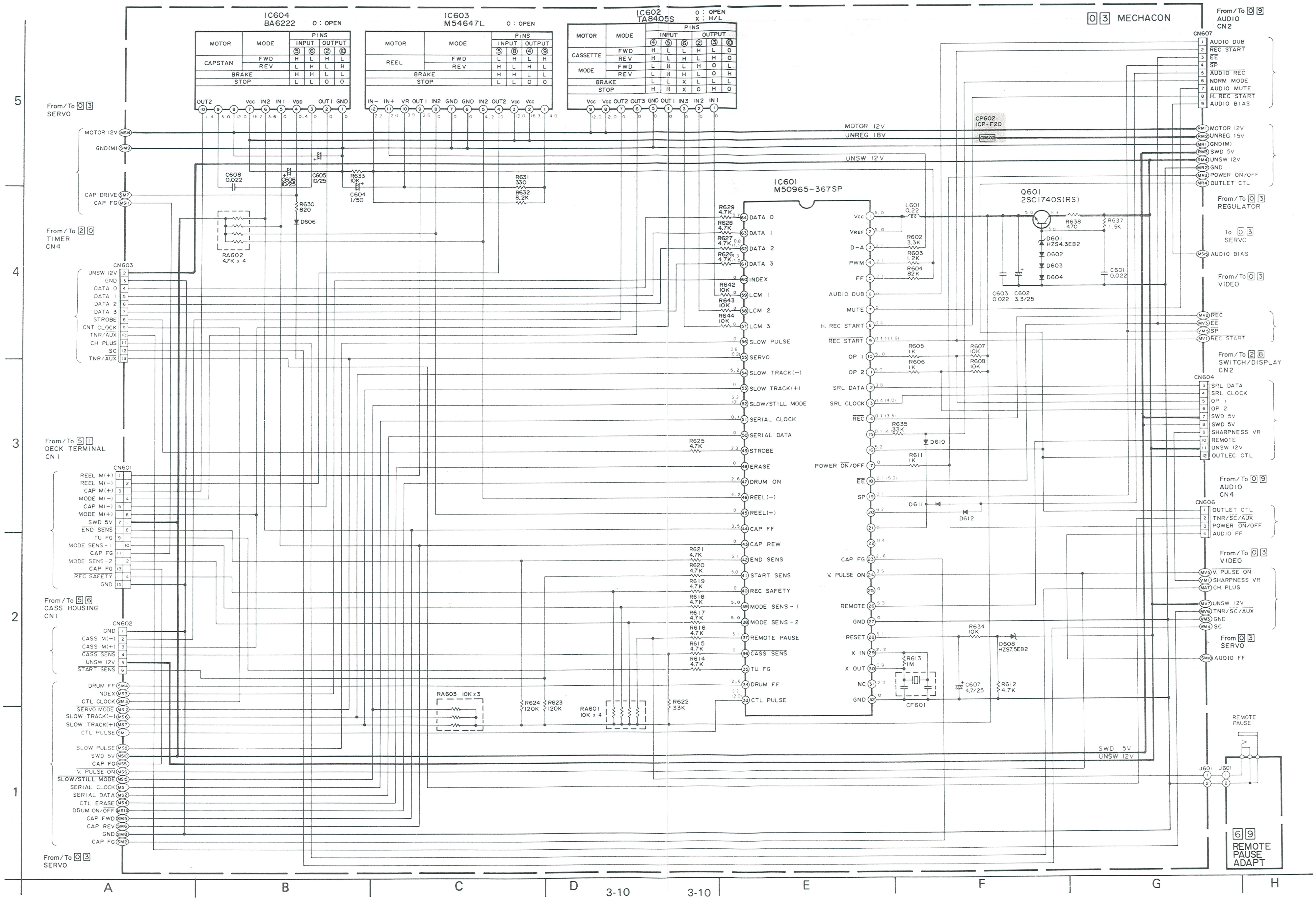

Q101,Q102,Q204 2SC1740S(QRS)
Q201 DTC124ES
Q105 DTC144WS
Q103 2SA933S(RS)
Q104 2SC1740S(QRS)
From/To 4 3 PRE/REC CN1
CN101
SYNC
GND
PB FM
REC FM
GND
GND
NC
PB COLOR
From/To 0 6 TERMINAL JP103
JP103
SC
NC
GND
NC
UNSW 5V
NC
NC
UNSW 12V
RF AUDIO
From 0 3 REGULATOR
UNSW 5V
SWD 12V
From/To 4 3 PRE/REC CN2
CN102
COL ROT CTL
GND
DRUM FF
SWD 5V
NC
REC
REC START
From/To 0 3 MECHACON
SC
CH PLUS
UNSW 12V
SWD 5V
REC START
REC
SP
TNR/SC/AUX
V. PULSE ON
EE
GND
SHARP VR
TP GND
IC102 MSM6967RS
IC103 BX6385
R112 Y NR NC BAL
R204 REC FM
SWD 5V
SWD 12V
UNSW 12V
Q201
Q204
Q101
Q102
Q103
Q104
Q105
Q106
Q107
Q108
Q207
Q208
TP121
TP106
1H DL
LPF 101
EQ 102
DEEMP
DOC SW
NR
CLAMP
MAIN EMP
FREQ MOD
W/D CLIP
DEMOD
DOUBLE LIMITER
DOC
FM ENV DET
DTL ENHANCER
SYNC SEP
Y/C MIX
PB AMP
AGC
HPF & LIMITER
N.C AMP
APT
CTL
MUT
EQ 101
LPF 102
IC101
PB/REC
REC 0.3 Vp-p
PB REC 0.3 Vp-p
PB 0.4 Vp-p
REC 0.5 Vp-p
REC 1.0 Vp-p
From/To 0 3 SERVO
SYNC
YNR PULSE
3fsc
DRUM FF
V PULSE
From/To 0 6 TERMINAL
VIDEO
VIDEO
GND
PB 12V
From/To RF CONVERTER
VIDEO
RF AUDIO
UNSW 12V
GND
SWD 12V
From/To 0 8 TUNER/CTL,CN4
CN103
PICTURE MUTE
GND
UNSW 12V
VIDEO
GND
PB 12V
0 3 VIDEO (MAIN)
— Luminance Section —
Q207 DTA124ES
Q208 DTC124ES
IC101 PB20166G(EG) PB20166C(E)
Q106 DTC124ES
Q107 2SB810H,J
Q108 2SA933S(RS)
A
B
C
D
E
F
G
H
1
2
3
4
5


03 VIDEO (MAIN)
— Color Section —
Q305,Q351 Q306
DTC124ES 2SA933S(RS)
IC301
PB20227A
Q308
2SC1740S(RS)
Q301, Q302, Q303, Q307
2SC1740S(RS)
SWD5V
REC
1.0 Vp-p
REG
ID DET
COLLOR KILLER
REC APC
PB APC
321FH VCO
1/8 C.D.
SUB CONV
X'tal OSC
3fc GEN
AUTO ADJ.
H.SYNC E-E CTL
PB KILLER
H. DISC
COMB DRIVE
MAIN CONV
AUTO BALL
BUFF
ACC
ACC DET
4 PHASE ROTATOR
REC KILLER
LPF
IC301
X301
BPF 302
BPF 301
CF301
LPF 301
EQ 301
Q301
Q302
Q303
Q307
Q308
Q351
TP205
TP304
TP351
REC
0.03 Vp-p
E-E REC
0.2 Vp-p
PB
0.05 Vp-p
R321
REC COLOR LEVEL
REC/PB
4.5 Vp-p
IC351
1/2fH DET
COMP
LIM
CLAMP
MONO MULTI
S.DATA L.LIM
FM DET
ATT (-13dB)
(12.7dB)
PAL
SECAM
A/B
PB/REC
NC
GND
Vcc
DL301
L353
SECAM DET
IC351
BA7106LS
JP102
66 MAIN SUB
Q271
2SC1740S(QRS)
Q272,Q273
DTC144ES
Q271
Q272
Q273
D271
D272
A
B
D
E
F
G
H
J
K
L
M
N
O
P
Q
R

**NOTE:** Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

## 3.10 MECHANISM CONTROL AND REMOTE PAUSE ADAPT SCHEMATIC DIAGRAMS

**NOTE:** Shaded ( ▨ ) parts are critical for safety. Replace only with specified part numbers.



IC604 BA6222 O : OPEN

| MOTOR | MODE | INPUT ⑤ | INPUT ⑥ | OUTPUT ② | OUTPUT ⑩ |
|---|---|---|---|---|---|
| CAPSTAN | FWD | H | L | H | L |
| | REV | L | H | L | H |
| BRAKE | | H | H | L | L |
| STOP | | L | L | O | O |

IC603 M54647L O : OPEN

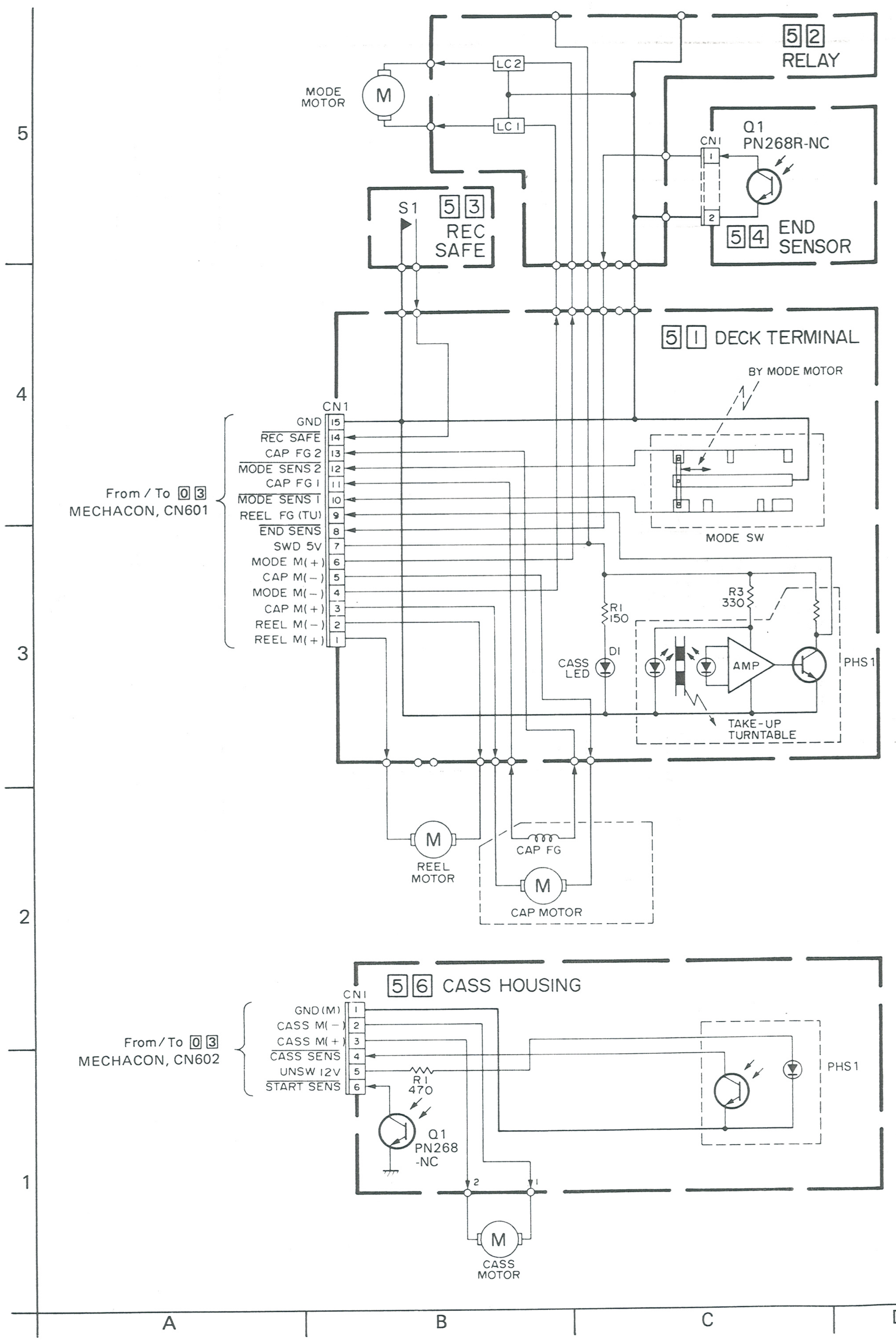
| MOTOR | MODE | INPUT ⑤ | INPUT ⑧ | OUTPUT ④ | OUTPUT ⑨ |
|---|---|---|---|---|---|
| REEL | FWD | L | H | L | H |
| | REV | H | L | H | L |
| BRAKE | | H | H | L | L |
| STOP | | L | L | O | O |

IC602 TA8405S O : OPEN X : H/L

| MOTOR | MODE | INPUT ④ | INPUT ⑤ | INPUT ⑥ | OUTPUT ② | OUTPUT ③ | OUTPUT ⑩ |
|---|---|---|---|---|---|---|---|
| CASSETTE | FWD | H | L | L | H | L | O |
| | REV | H | L | H | L | H | O |
| MODE | FWD | L | H | L | H | O | L |
| | REV | L | H | H | L | O | H |
| BRAKE | | L | L | X | L | L | L |
| STOP | | H | H | X | O | H | O |

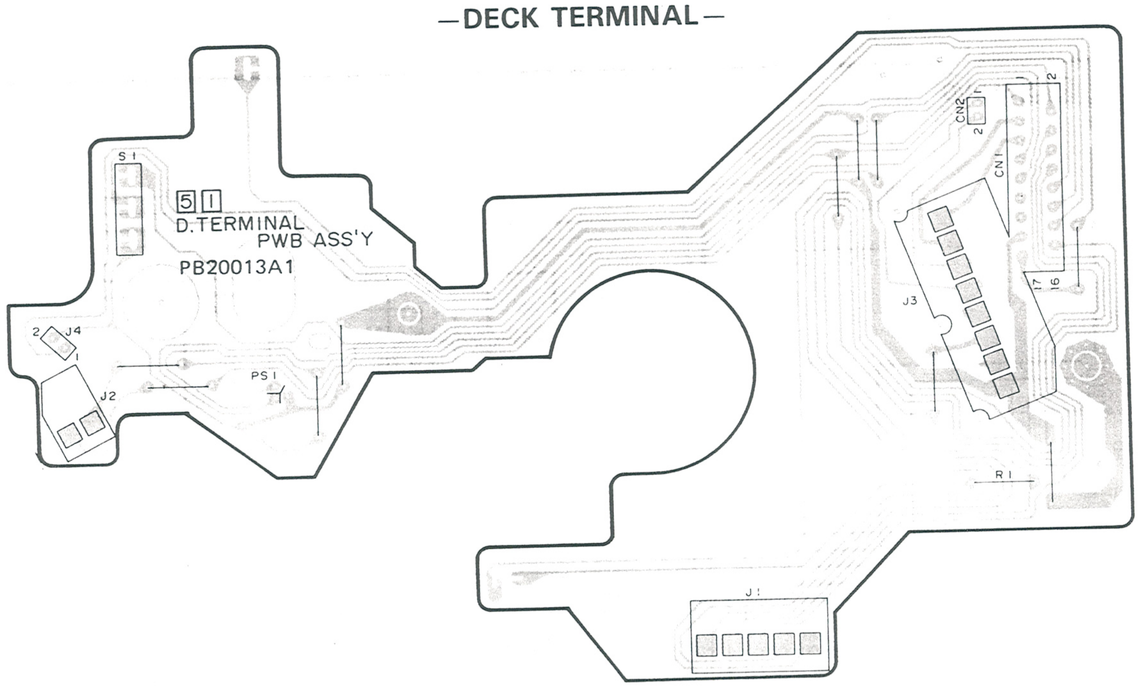
OUT2 Vcc IN2 IN1 VDD OUT1 GND
IN− IN+ VR OUT1 IN2 GND GND IN2 OUT2 Vcc Vcc
Vcc Vcc OUT2 OUT3 GND OUT1 IN3 IN2 IN1
03 MECHACON
From/To 03 SERVO
MOTOR 12V
GND(M)
CAP DRIVE
CAP FG
From/To 20 TIMER CN4
CN603
UNSW 12V
GND
DATA 0
DATA 1
DATA 2
DATA 3
STROBE
CNT CLOCK
TNR/AUX
CH PLUS
SC
TNR/AUX
From/To 51 DECK TERMINAL CN1
CN601
REEL M(+)
REEL M(−)
CAP M(+)
MODE M(−)
CAP M(−)
MODE M(+)
SWD 5V
END SENS
TU FG
MODE SENS-1
CAP FG
MODE SENS-2
CAP FG
REC SAFETY
GND
From/To 56 CASS HOUSING CN1
CN602
GND
CASS M(−)
CASS M(+)
CASS SENS
UNSW 12V
START SENS
DRUM FF
INDEX
CTL CLOCK
SERVO MODE
SLOW TRACK(−)
SLOW TRACK(+)
CTL PULSE
SLOW PULSE
SWD 5V
CAP FG
V. PULSE ON
SLOW/STILL MODE
SERIAL CLOCK
SERIAL DATA
CTL ERASE
DRUM ON/OFF
CAP FWD
CAP REV
GND
CAP FG
From/To 03 SERVO
C608 0.022
C606 10/25
C605 10/25
R633 10K
C604 1/50
R630 820
D606
R631 330
R632 8.2K
RA602 4.7K x 4
MOTOR 12V
UNREG 18V
UNSW 12V
CP602 ICP-F20
IC601 M50965-367SP
R629 4.7K
R628 4.7K
R627 4.7K
R626 4.7K
R642 10K
R643 10K
R644 10K
DATA 0
DATA 1
DATA 2
DATA 3
INDEX
LCM 1
LCM 2
LCM 3
SLOW PULSE
SERVO
SLOW TRACK(−)
SLOW TRACK(+)
SLOW/STILL MODE
SERIAL CLOCK
SERIAL DATA
R625 4.7K
STROBE
ERASE
DRUM ON
REEL(−)
REEL(+)
CAP FF
CAP REW
R621 4.7K
END SENS
R620 4.7K
START SENS
R619 4.7K
REC SAFETY
R618 4.7K
MODE SENS-1
R617 4.7K
MODE SENS-2
R616 4.7K
REMOTE PAUSE
R615 4.7K
CASS SENS
R614 4.7K
TU FG
DRUM FF
CTL PULSE
Vcc
VREF
D-A
PWM
FF
AUDIO DUB
MUTE
H. REC START
REC START
OP 1
OP 2
SRL DATA
SRL CLOCK
REC
POWER ON/OFF
EE
SP
CAP FG
V. PULSE ON
REMOTE
GND
RESET
X IN
X OUT
NC
GND
L601 0.22
R602 3.3K
R603 1.2K
R604 82K
R605 1K
R606 1K
R607 10K
R608 10K
R635 33K
D610
R611 1K
D611
D612
R634 10K
D608 HZS7.5EB2
R613 1M
CF601
C607 4.7/25
R612 4.7K
RA603 10K x 3
R624 120K
R623 120K
RA601 10K x 4
R622 33K
Q601 2SC1740S(RS)
R638 470
R637 1.5K
D601 HZS4.3EB2
D602
D603
D604
C601 0.022
C603 0.022
C602 3.3/25
From/To 09 AUDIO CN2
CN607
AUDIO DUB
REC START
EE
SP
AUDIO REC
NORM MODE
AUDIO MUTE
H. REC START
AUDIO BIAS
MOTOR 12V
UNREG 15V
GND(M)
SWD 5V
UNSW 12V
GND
POWER ON/OFF
OUTLET CTL
From/To 03 REGULATOR
To 03 SERVO
AUDIO BIAS
From/To 03 VIDEO
REC
EE
SP
REC START
From/To 28 SWITCH/DISPLAY CN2
CN604
SRL DATA
SRL CLOCK
OP 1
OP 2
SWD 5V
SWD 5V
SHARPNESS VR
REMOTE
UNSW 12V
OUTLEC CTL
From/To 09 AUDIO CN4
CN606
OUTLET CTL
TNR/SC/AUX
POWER ON/OFF
AUDIO FF
From/To 03 VIDEO
V. PULSE ON
SHARPNESS VR
CH PLUS
UNSW 12V
TNR/SC/AUX
GND
SC
From 03 SERVO
AUDIO FF
SWD 5V
UNSW 12V
REMOTE PAUSE
J601
J601
69 REMOTE PAUSE ADAPT
5
4
3
2
1
A
B
C
D
E
F
G
H

## 3.11 DECK TERMINAL SCHEMATIC DIAGRAMS

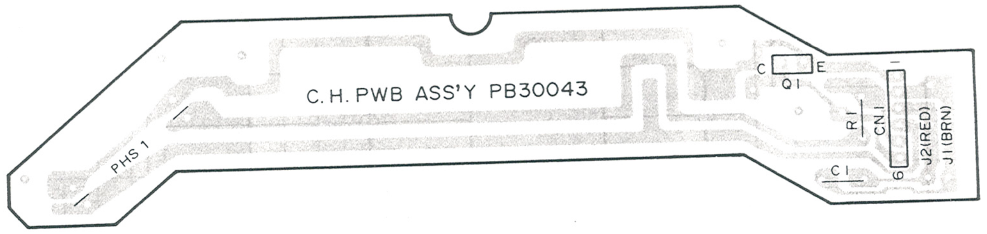

52 RELAY
MODE MOTOR
M
LC2
LC1
Q1
PN268R-NC
CN1
1
2
54 END SENSOR
S1 53 REC SAFE
51 DECK TERMINAL
BY MODE MOTOR
CN1
GND 15
REC SAFE 14
CAP FG2 13
MODE SENS2 12
CAP FG1 11
MODE SENS1 10
REEL FG (TU) 9
END SENS 8
SWD 5V 7
MODE M(+) 6
CAP M(−) 5
MODE M(−) 4
CAP M(+) 3
REEL M(−) 2
REEL M(+) 1
From/To 03 MECHACON, CN601
MODE SW
R1 150
R3 330
CASS LED
D1
AMP
PHS1
TAKE-UP TURNTABLE
REEL MOTOR
CAP FG
CAP MOTOR
56 CASS HOUSING
CN1
GND(M) 1
CASS M(−) 2
CASS M(+) 3
CASS SENS 4
UNSW 12V 5
START SENS 6
From/To 03 MECHACON, CN602
R1 470
Q1 PN268 -NC
PHS1
CASS MOTOR
1
2
3
4
5
A
B
C
D

## 3.12 DECK TERMINAL CIRCUIT BOARDS

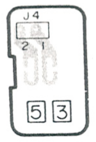
—DECK TERMINAL—


S1
51 D.TERMINAL PWB ASS'Y
PB20013A1
J4
J2
PS1
J3
CN2
CN1
17
16
R1
J1

—CASSETTE HOUSING—

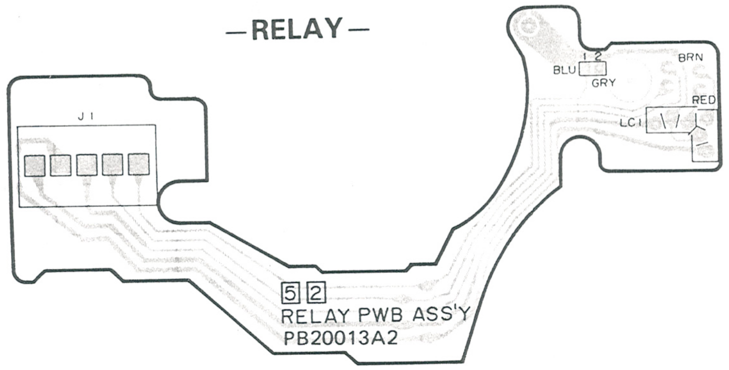

C.H. PWB ASS'Y PB30043
PHS1
Q1
C
E
R1
CN1
J2(RED)
J1(BRN)
C1
6

—REC SAFETY—

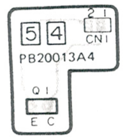


PB20013A3

—RELAY—

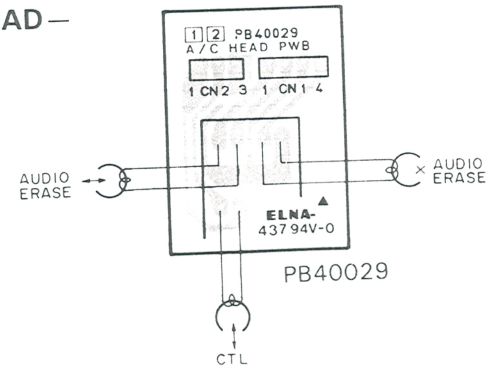

J1
BLU
GRY
BRN
RED
LC1
52
RELAY PWB ASS'Y
PB20013A2

—END SENSOR—


54
PB20013A4
CN1
Q1
E C

PB20013A4

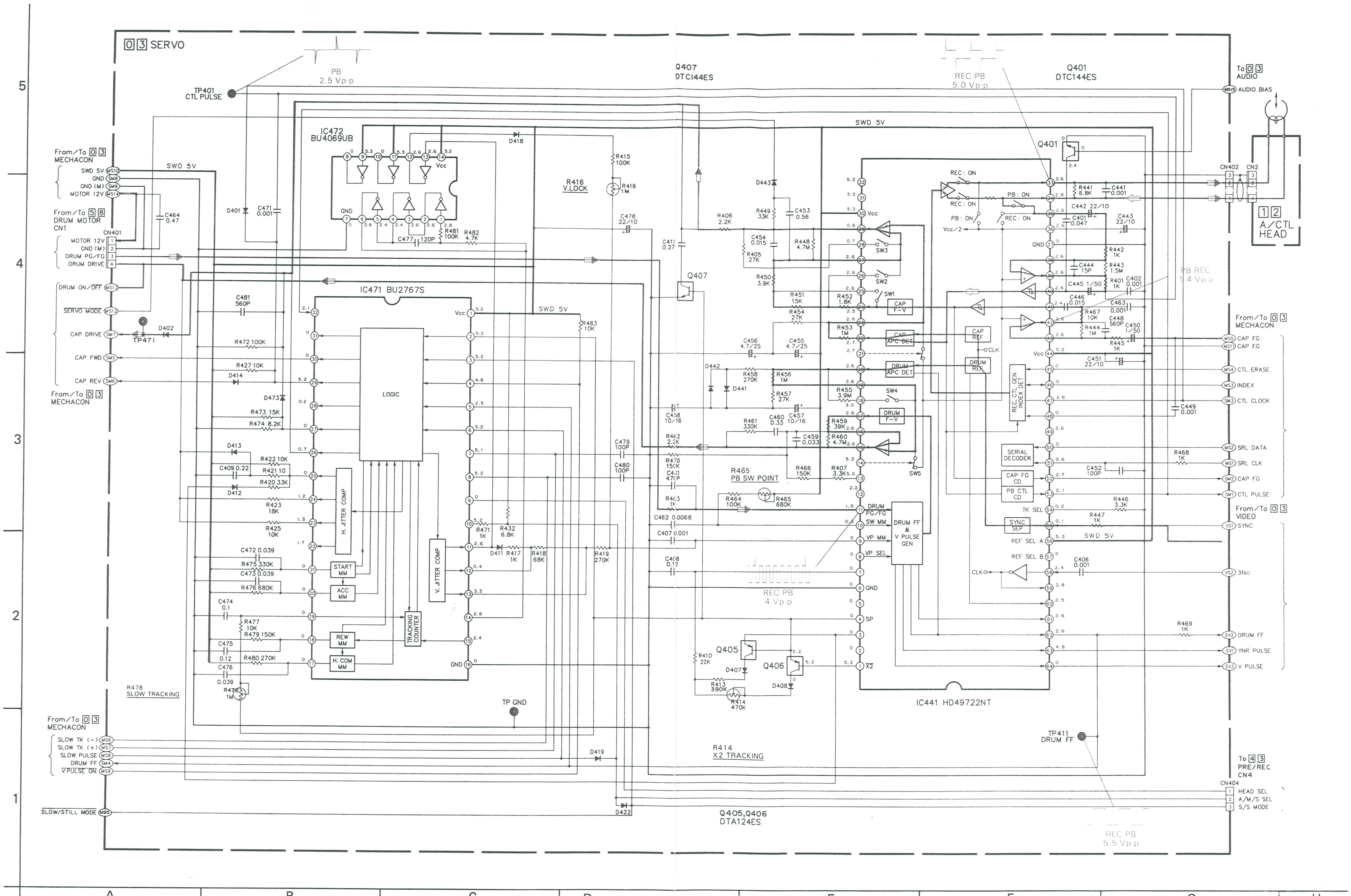
—AUDIO/CTL HEAD—


12 PB40029
A/C HEAD PWB
1 CN2 3
1 CN1 4
ELNA-
43794V-0
AUDIO ERASE
AUDIO ERASE
CTL

PB40029

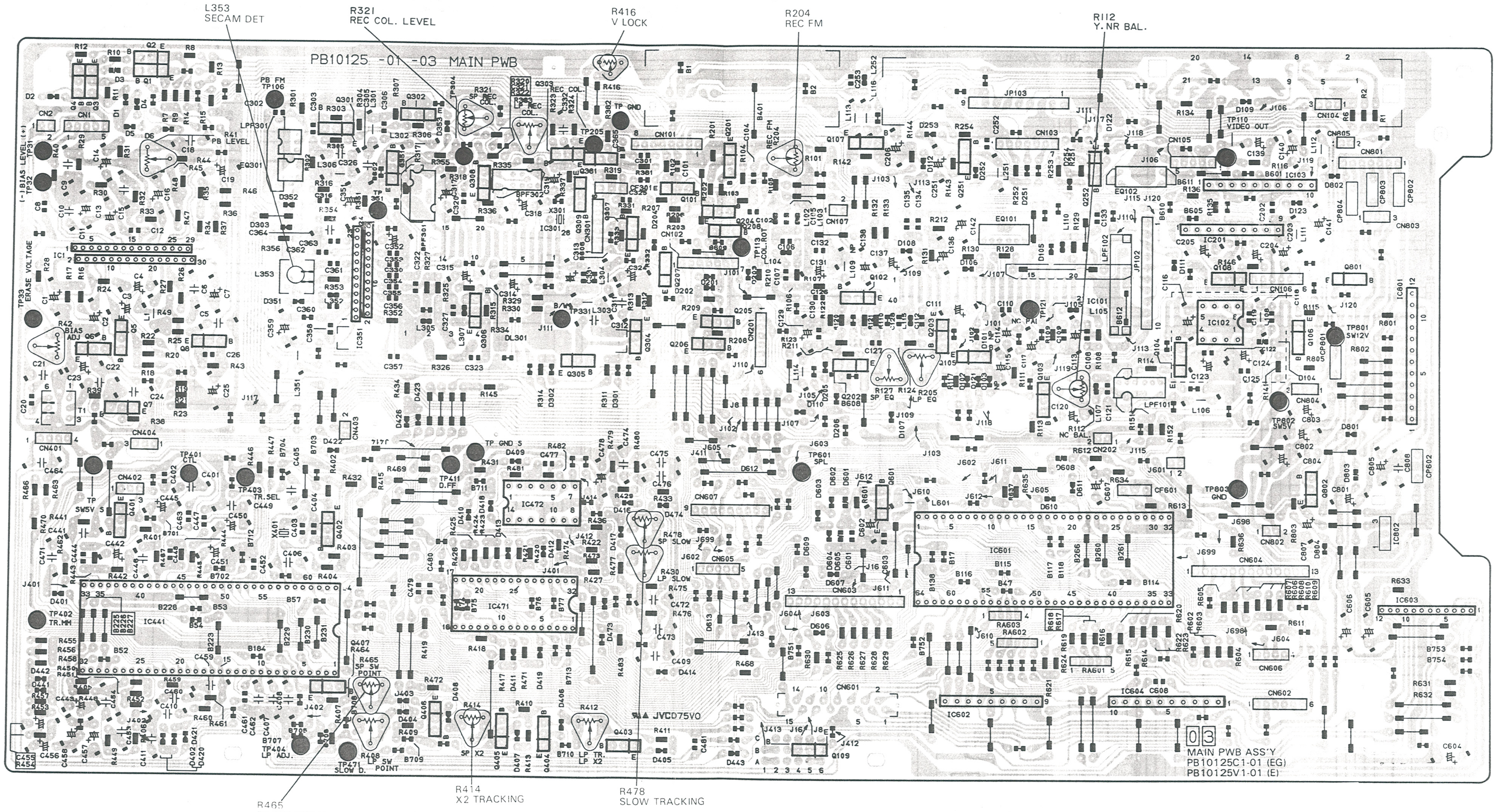
E
F
G
H

## 3.13 SERVO SCHEMATIC DIAGRAM

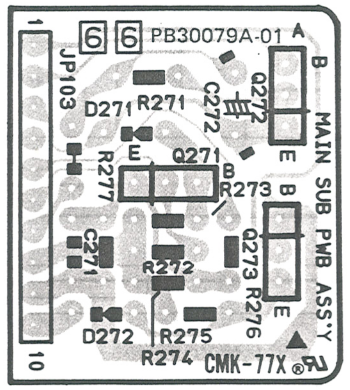

03 SERVO
TP401 CTL PULSE
PB 2.5 Vp-p
Q407 DTC144ES
REC/PB 5.0 Vp-p
Q401 DTC144ES
To 03 AUDIO
AUDIO BIAS
IC472 BU4069UB
D418
R415 100K
R416 1M
R416 V.LOCK
SWD 5V
From/To 03 MECHACON
SWD 5V
GND
GND (M)
MOTOR 12V
From/To 58 DRUM MOTOR CN1
CN401
MOTOR 12V
GND (M)
DRUM PG/FG
DRUM DRIVE
C464 0.47
D401
C471 0.001
C477 120P
R481 100K
R482 4.7K
C478 22/10
Q401
REC : ON
PB : ON
Vcc/2
R441 6.8K
C441 0.001
C442 22/10
C401 0.047
C443 22/10
CN402
CN2
12 A/CTL HEAD
DRUM ON/OFF
SERVO MODE
CAP DRIVE
TP471
D402
CAP FWD
CAP REV
From/To 03 MECHACON
C481 560P
IC471 BU2767S
LOGIC
R472 100K
R427 10K
D414
D473
R473 15K
R474 8.2K
D413
C409 0.22
R422 10K
R421 10
R420 33K
D412
R423 18K
R425 10K
H. JITTER COMP
C472 0.039
R475 330K
C473 0.039
R476 680K
START MM
ACC MM
V. JITTER COMP
TRACKING COUNTER
C474 0.1
R477 10K
R479 150K
REW MM
C475 0.12
R480 270K
C476 0.039
H. COM MM
R478 SLOW TRACKING
TP GND
R483 10K
R471 1K
R432 6.8K
D411
R417 1K
R418 68K
R419 270K
C479 100P
C480 100P
C411 0.27
Q407
R406 2.2K
R449 33K
C453 0.56
D443
C454 0.015
R405 27K
R448 4.7M
R450 3.9K
R451 15K
R452 1.8K
R454 27K
R453 1M
C456 4.7/25
C455 4.7/25
D442
D441
R458 270K
R456 1M
R457 27K
C458 10/16
R461 330K
C460 0.33
C457 10/16
C459 0.033
R455 3.9M
R459 39K
R460 4.7M
R462 2.2K
R470 150K
C461 470P
R465 PB SW POINT
R466 150K
R407 3.3K
R463 1K
R464 100K
R465 680K
C462 0.0068
C407 0.001
C408 0.12
REC PB 4 Vp-p
SW1
SW2
SW3
SW4
SW5
CAP F-V
CAP APC DET
DRUM APC DET
DRUM F-V
CAP REF
DRUM REF
CLK
DRUM PG/FG
SW MM
VP MM
VP SEL
GND
SP
X2
DRUM FF & V PULSE GEN
Q405
Q406
R410 22K
D407
D408
R413 390K
R414 470K
IC441 HD49722NT
R414 X2 TRACKING
Q405,Q406 DTA124ES
PB REC 1.4 Vp-p
R442 1K
R443 1.5M
C444 15P
C445 1/50
R401 1K
C402 0.001
C446 0.015
C463 0.001
R467 10K
C448 560P
R444 1M
C450 1/50
R445 1K
C451 22/10
REC,CTL GEN INDEX DET
C449 0.001
SERIAL DECODER
CAP FG CD
PB CTL CD
SYNC SEP
TK SEL
REF SEL A
REF SEL B
CLK
C452 100P
R468 1K
R446 3.3K
R447 1K
C406 0.001
R469 1K
From/To 03 MECHACON
CAP FG
CAP FG
CTL ERASE
INDEX
CTL CLOCK
SRL DATA
SRL CLK
CAP FG
CTL PULSE
From/To 03 VIDEO
SYNC
3fsc
DRUM FF
YNR PULSE
V PULSE
TP411 DRUM FF
To 43 PRE/REC CN4
CN404
HEAD SEL
A/M/S SEL
S/S MODE
REC PB 5.5 Vp-p
From/To 03 MECHACON
SLOW TK (-)
SLOW TK (+)
SLOW PULSE
DRUM FF
V PULSE ON
SLOW/STILL MODE
D419
D422
A
B
C
D
E
F
G
H
1
2
3
4
5

## 3.14 MAIN, MAIN SUB AND REMOTE PAUSE ADAPT CIRCUIT BOARDS

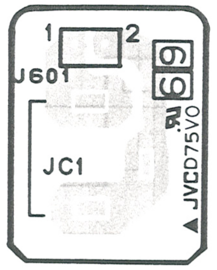
### —MAIN—


L353
SECAM DET
R321
REC COL. LEVEL
R416
V LOCK
R204
REC FM
R112
Y. NR BAL.
PB10125 -01 -03 MAIN PWB
JVCD75V0
MAIN PWB ASS'Y
PB10125C1-01 (EG)
PB10125V1-01 (E)
R465
PB SW POINT
R414
X2 TRACKING
R478
SLOW TRACKING

### —MAIN SUB—


PB30079A-01
JP103
D271
R271
C272
Q272
Q271
R277
R273
C271
R272
Q273
R276
D272
R275
R274
CMK-77X
MAIN SUB PWB ASS'Y

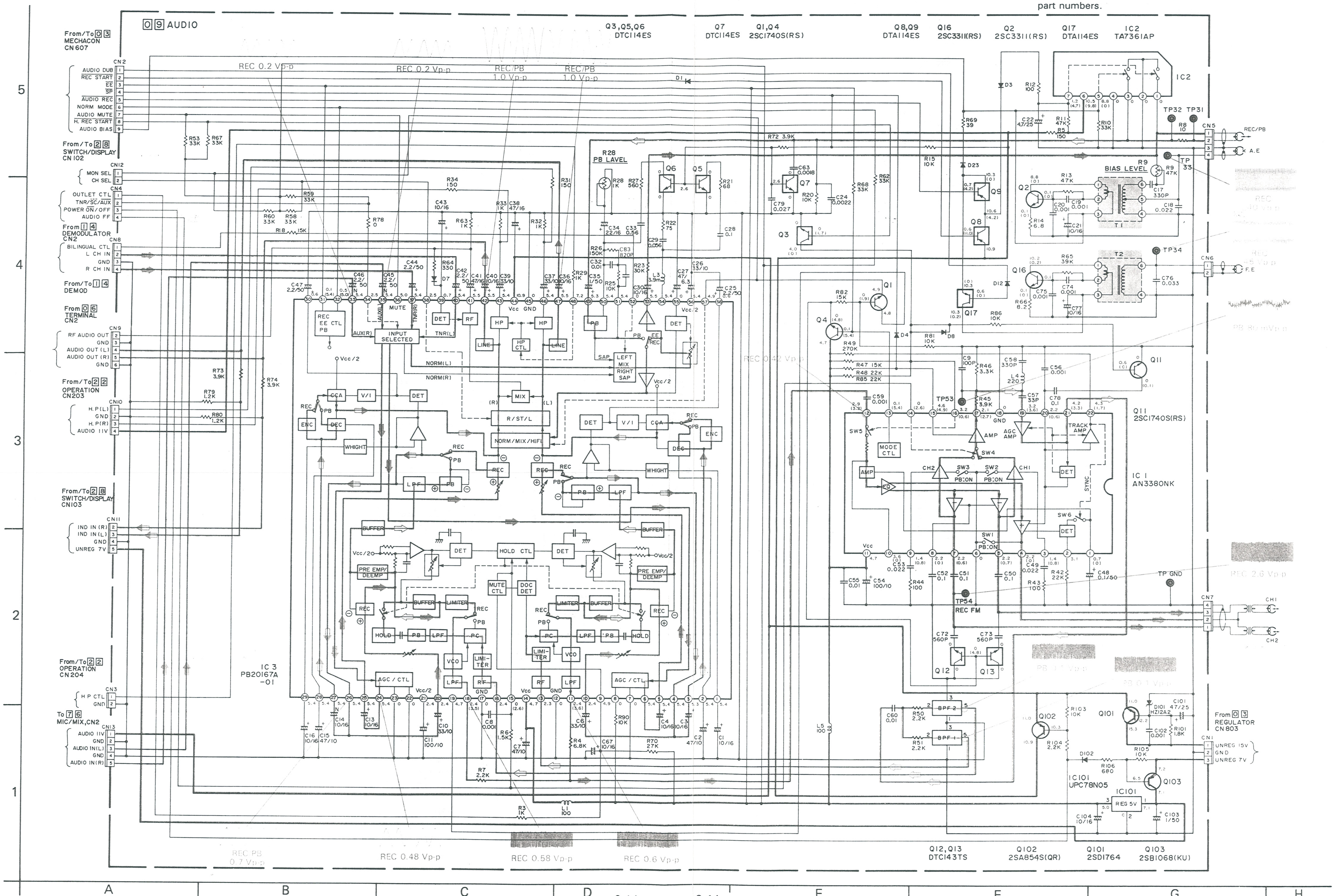
### —REMOTE PAUSE ADAPT—


J601
JC1
JVCD75V0

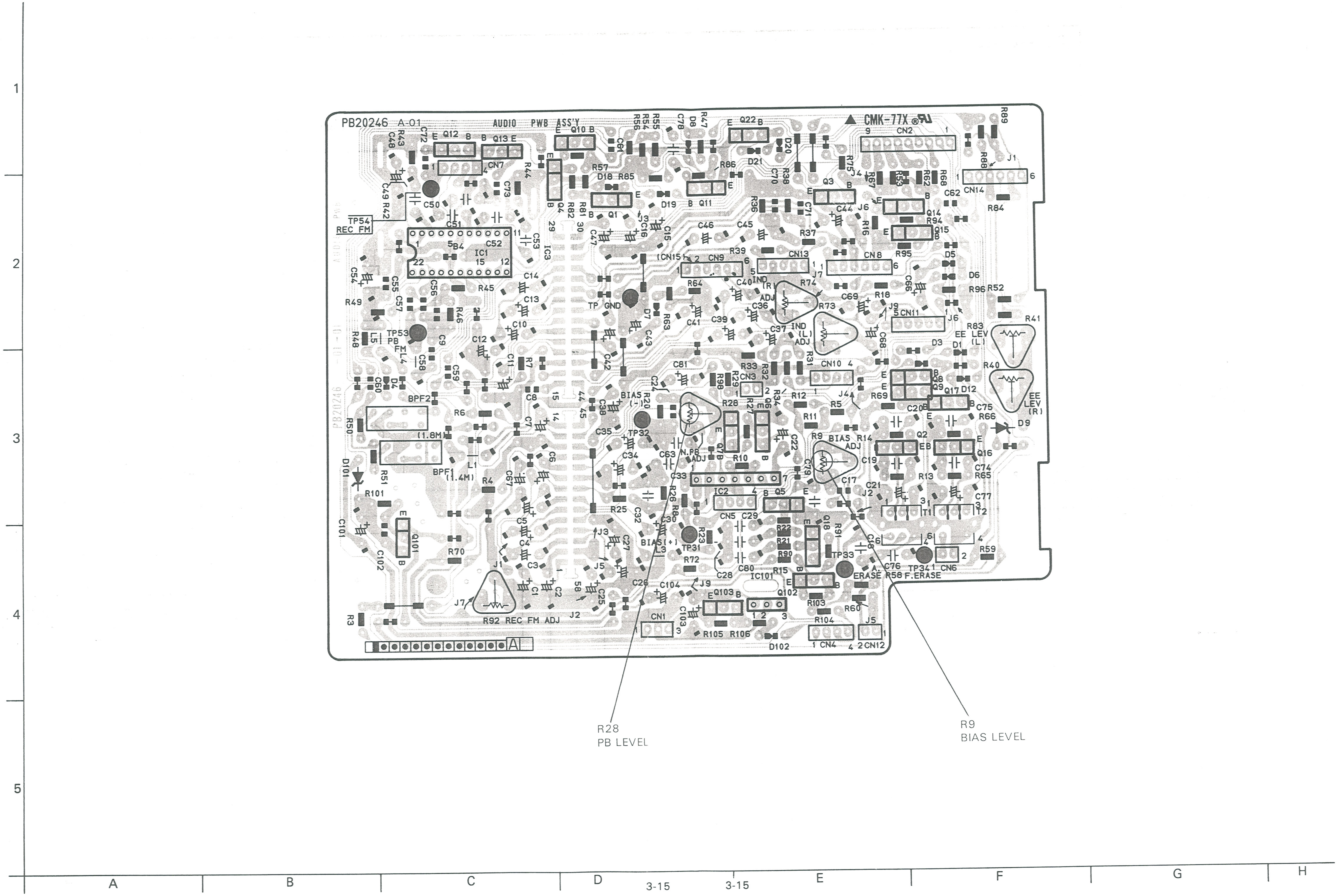
PB10125A2

## 3.15 AUDIO SCHEMATIC DIAGRAM

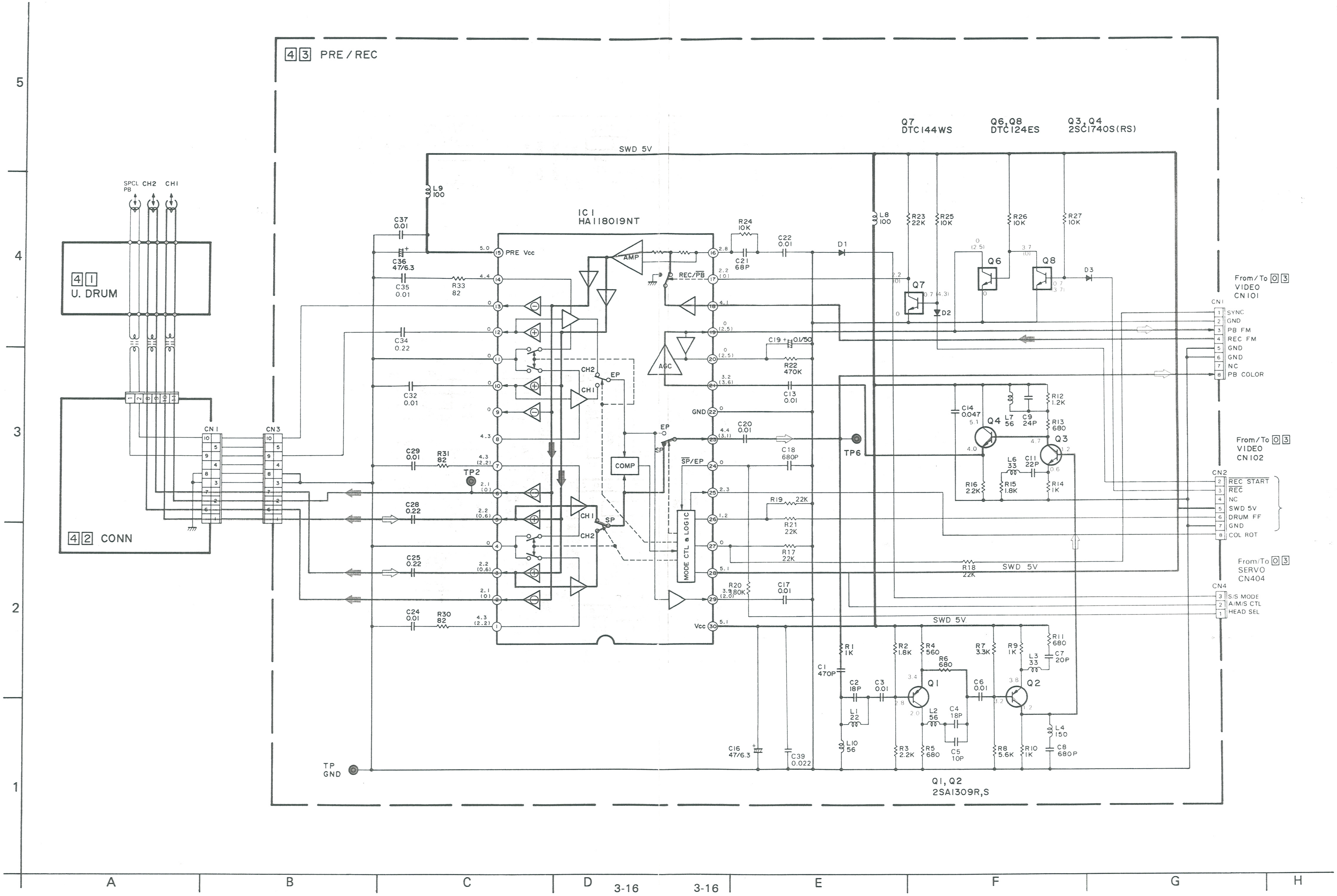
**NOTE:** Shaded (▨) parts are critical for safety. Replace only with specified part numbers.


09 AUDIO
Q3,Q5,Q6 DTC114ES
Q7 DTC114ES
Q1,Q4 2SC1740S(RS)
Q8,Q9 DTA114ES
Q16 2SC3311(RS)
Q2 2SC3311(RS)
Q17 DTA114ES
IC2 TA7361AP
From/To 03 MECHACON CN607
CN2
AUDIO DUB
REC START
EE
SP
AUDIO REC
NORM MODE
AUDIO MUTE
H. REC START
AUDIO BIAS
From/To 28 SWITCH/DISPLAY CN102
CN12
MON SEL
CH SEL
CN4
OUTLET CTL
TNR/SC/AUX
POWER ON/OFF
AUDIO FF
From 14 DEMODULATOR CN2
CN8
BILINGUAL CTL
L CH IN
GND
R CH IN
From/To 14 DEMOD
From 06 TERMINAL CN2
CN9
RF AUDIO OUT
AUDIO OUT (L)
AUDIO OUT (R)
From/To 22 OPERATION CN203
CN10
H.P(L)
H.P(R)
AUDIO IIV
From/To 28 SWITCH/DISPLAY CN103
CN11
IND IN (R)
IND IN (L)
UNREG 7V
From/To 22 OPERATION CN204
CN3
H P CTL
To 76 MIC/MIX,CN2
CN13
AUDIO IIV
AUDIO IN(L)
AUDIO IN(R)
REC 0.2 Vp-p
REC/PB 1.0 Vp-p
R28 PB LAVEL
BIAS LEVEL
TP32
TP31
TP33
TP34
TP53
TP54 REC FM
TP GND
CN5
REC/PB
A.E
CN6
F.E
CN7
CH1
CH2
IC1 AN3380NK
Q11 2SC1740S(RS)
IC3 PB20167A -01
MUTE
INPUT SELECTED
R/ST/L
NORM/MIX/HIFI
BUFFER
HOLD CTL
PRE EMP/DEEMP
LIMITER
MUTE CTL
DOC DET
AGC/CTL
VCO
MODE CTL
TRACK AMP
AGC AMP
SW1
SW2
SW3
SW4
SW5
SW6
PB:ON
BPF 1
BPF 2
From 03 REGULATOR CN803
CN1
UNREG 15V
GND
UNREG 7V
IC101 UPC78N05
REG 5V
D101 HZ12A2
Q12,Q13 DTC143TS
Q102 2SA854S(QR)
Q101 2SD1764
Q103 2SB1068(KU)
REC PB 0.7 Vp-p
REC 0.48 Vp-p
REC 0.58 Vp-p
REC 0.6 Vp-p
REC 0.42 Vp-p
A
B
C
D
E
F
G
H
1
2
3
4
5

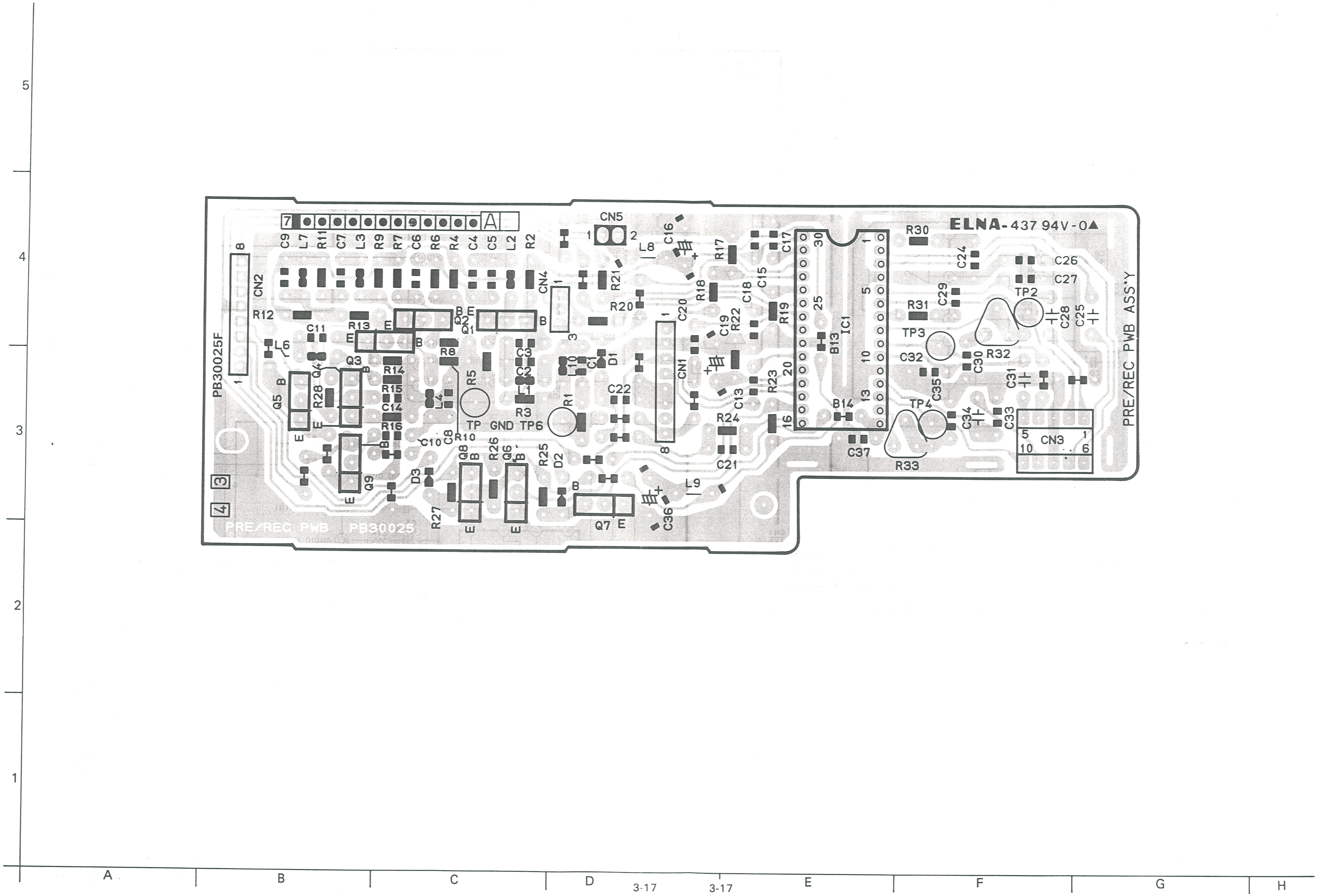
## 3.16 AUDIO CIRCUIT BOARDS


PB20246 A-01
AUDIO PWB ASS'Y
CMK-77X
TP54 REC FM
TP53 PB FM
TP GND
BIAS (-)
TP32
N.PB ADJ
BIAS (+)
TP31
TP33 ERASE
TP34 F.ERASE
IND (R) ADJ
IND (L) ADJ
BIAS ADJ
EE LEV (L)
EE LEV (R)
BPF1 (1.4M)
BPF2 (1.8M)
R92 REC FM ADJ
R28
PB LEVEL
R9
BIAS LEVEL
1
2
3
4
5
A
B
C
D
E
F
G
H
3-15
3-15

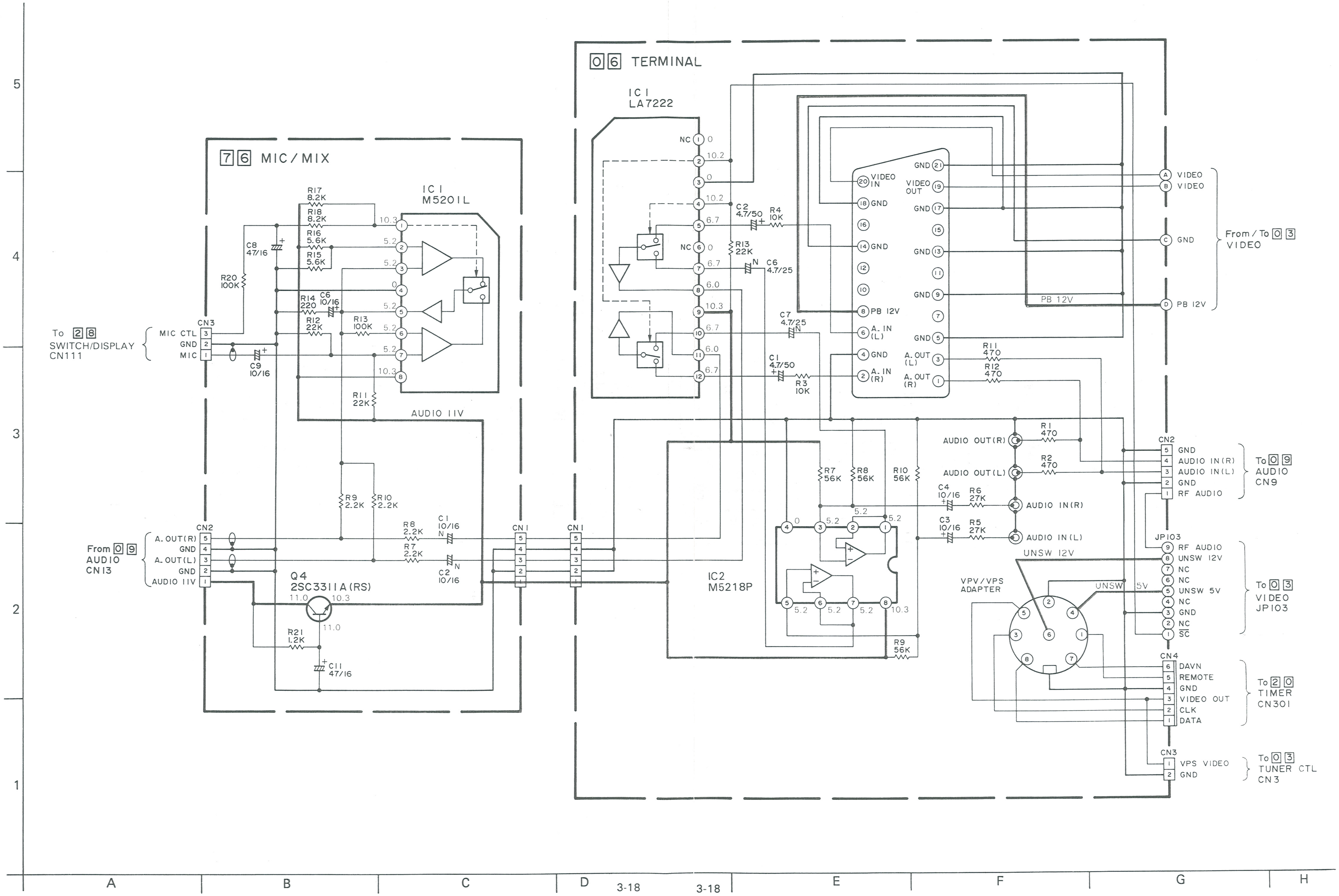
## 3.17 PRE/REC SCHEMATIC DIAGRAM


43 PRE / REC
41 U. DRUM
42 CONN
SPCL PB
CH2
CH1
CN1
CN3
IC1 HA118019NT
PRE Vcc
AMP
REC/PB
AGC
COMP
MODE CTL & LOGIC
CH1
CH2
EP
SP
SP/EP
GND
Vcc
SWD 5V
L9 100
L8 100
C37 0.01
C36 47/6.3
C35 0.01
R33 82
C34 0.22
C32 0.01
C29 0.01
R31 82
TP2
C28 0.22
C25 0.22
C24 0.01
R30 82
R24 10K
C21 68P
C22 0.01
D1
C19 0.1/50
R22 470K
C13 0.01
C20 0.01
C18 680P
TP6
R19 22K
R21 22K
R17 22K
R20 180K
C17 0.01
R18 22K
C16 47/6.3
C39 0.022
TP GND
Q7 DTC144WS
Q6, Q8 DTC124ES
Q3, Q4 2SC1740S(RS)
R23 22K
R25 10K
R26 10K
R27 10K
Q7
Q6
Q8
D2
D3
C14 0.047
L7 56
C9 24P
R12 1.2K
R13 680
Q4
Q3
L6 33
C11 22P
R16 2.2K
R15 1.8K
R14 1K
R1 1K
C1 470P
C2 18P
C3 0.01
L1 22
L10 56
R2 1.8K
R4 560
R6 680
Q1
L2 56
C4 18P
C5 10P
R3 2.2K
R5 680
R7 3.3K
R9 1K
R11 680
L3 33
C7 20P
C6 0.01
Q2
L4 150
C8 680P
R8 5.6K
R10 1K
Q1, Q2 2SA1309R,S
From/To 03 VIDEO CN101
CN1
SYNC
GND
PB FM
REC FM
GND
GND
NC
PB COLOR
From/To 03 VIDEO CN102
CN2
REC START
REC
NC
SWD 5V
DRUM FF
GND
COL ROT
From/To 03 SERVO CN404
CN4
S/S MODE
A/M/S CTL
HEAD SEL
1
2
3
4
5
A
B
C
D
E
F
G
H

## 3.18 PRE/REC CIRCUIT BOARD


ELNA-437 94V-0▲
PRE/REC PWB ASS'Y
PRE/REC PWB PB30025
PB30025F
7
A
C9 L7 R11 C7 L3 R9 R7 C6 R6 R4 C4 C5 L2 R2
CN2
CN4
CN5
CN1
CN3
IC1
R12 R13 R14 R15 R16 R8 R5 R3 R1 R10 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R30 R31 R32 R33
C1 C2 C3 C8 C10 C11 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37
L1 L4 L6 L8 L9 L10
Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9
D1 D2 D3
B13 B14
TP GND TP6
TP2 TP3 TP4
B E
3
4
1 2 3 5 10 13 16 20 25 30
5
4
3
2
1
A B C D E F G H
3-17
3-17

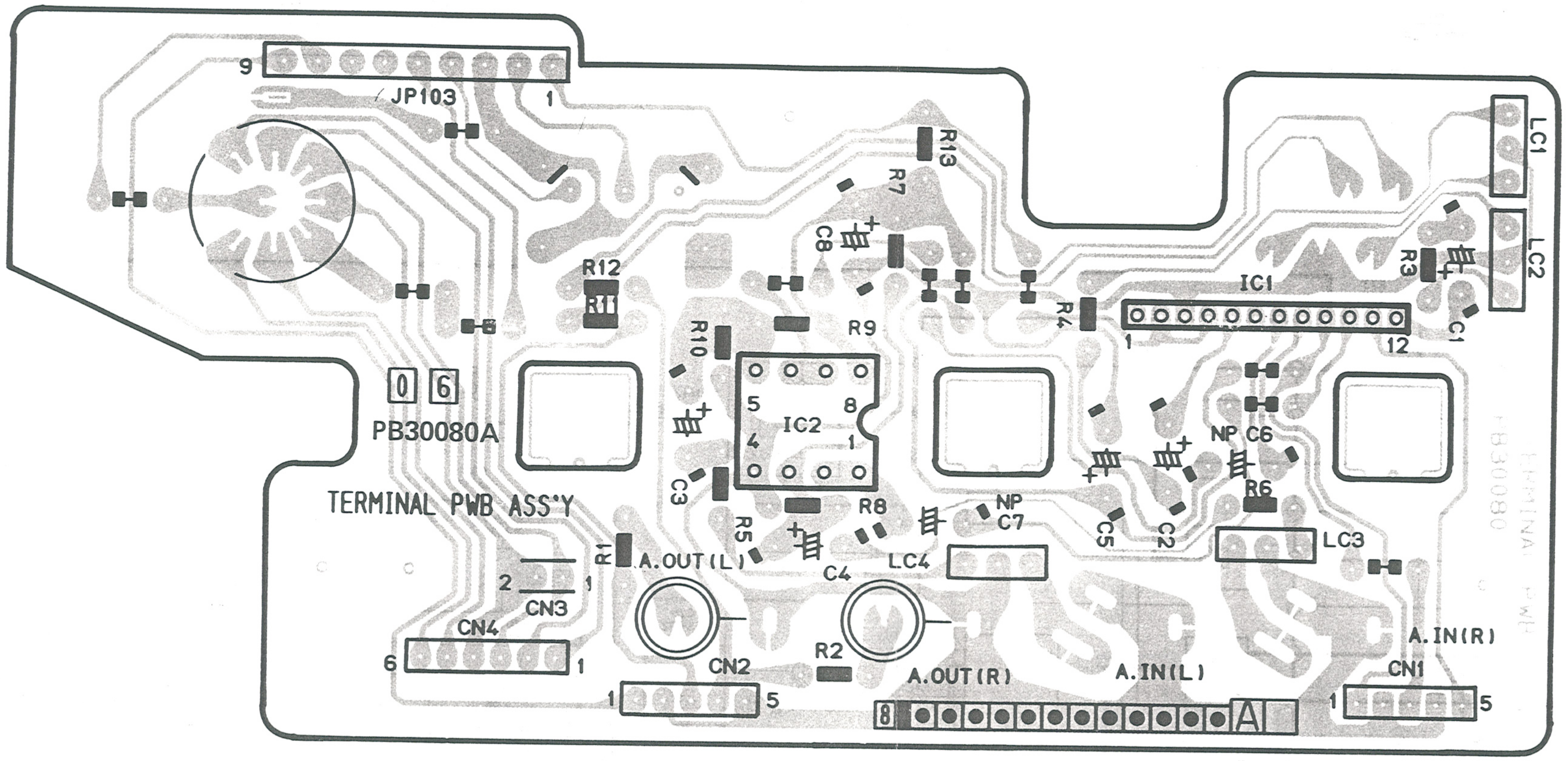
## 3.19 TERMINAL AND MIC/MIX SCHEMATIC DIAGRAMS



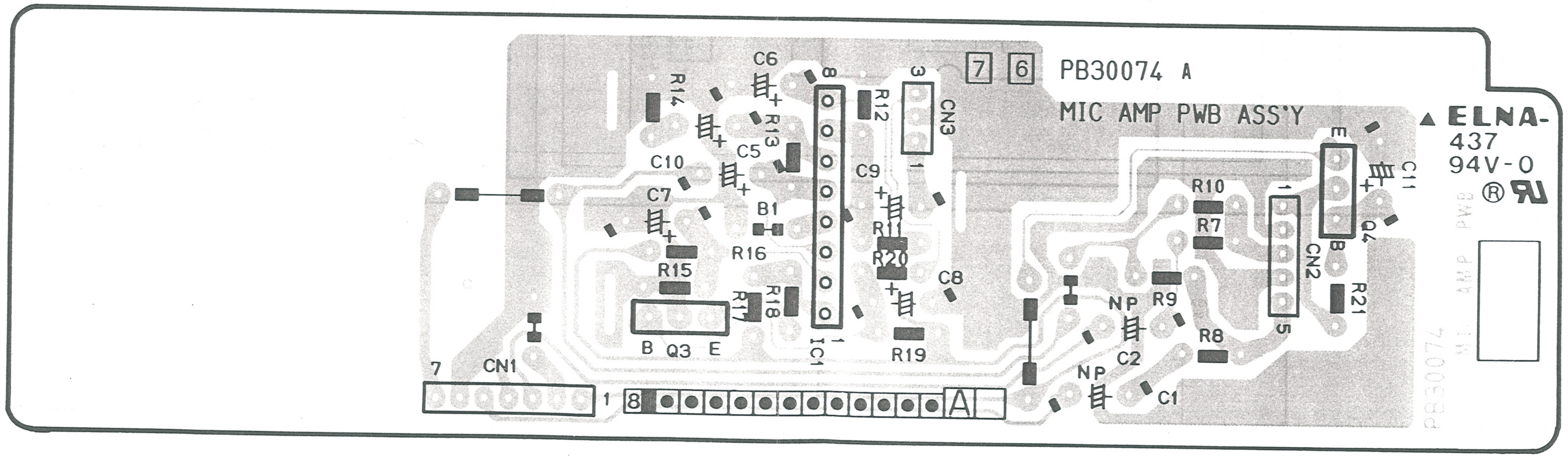
76 MIC/MIX
IC1 M5201L
R17 8.2K
R18 8.2K
R16 5.6K
R15 5.6K
C8 47/16
R20 100K
R14 220
C6 10/16
R12 22K
R13 100K
R11 22K
AUDIO 11V
CN3
MIC CTL
GND
MIC
C9 10/16
To 28 SWITCH/DISPLAY CN111
R9 2.2K
R10 2.2K
R8 2.2K
R7 2.2K
C1 10/16
C2 10/16
CN2
A. OUT(R)
GND
A. OUT(L)
GND
AUDIO 11V
From 09 AUDIO CN13
Q4 2SC3311A(RS)
R21 1.2K
C11 47/16
CN1
06 TERMINAL
IC1 LA7222
C2 4.7/50
R4 10K
R13 22K
C6 4.7/25
C7 4.7/25
C1 4.7/50
R3 10K
VIDEO IN
VIDEO OUT
GND
PB 12V
A. IN (L)
A. IN (R)
A. OUT (L)
A. OUT (R)
R11 470
R12 470
VIDEO
VIDEO
GND
PB 12V
From / To 03 VIDEO
AUDIO OUT(R)
AUDIO OUT(L)
R1 470
R2 470
R7 56K
R8 56K
R10 56K
C4 10/16
R6 27K
C3 10/16
R5 27K
AUDIO IN(R)
AUDIO IN(L)
IC2 M5218P
R9 56K
CN2
GND
AUDIO IN(R)
AUDIO IN(L)
GND
RF AUDIO
To 09 AUDIO CN9
JP103
RF AUDIO
UNSW 12V
NC
NC
UNSW 5V
NC
GND
NC
SC
To 03 VIDEO JP103
UNSW 12V
UNSW 5V
VPV/VPS ADAPTER
CN4
DAVN
REMOTE
GND
VIDEO OUT
CLK
DATA
To 20 TIMER CN301
CN3
VPS VIDEO
GND
To 03 TUNER CTL CN3
5
4
3
2
1
A
B
C
D
E
F
G
H

## 3.20 TERMINAL AND MIC/MIX CIRCUIT BOARDS

—TERMINAL—


9
JP103
1
R13
R7
C8
LC1
LC2
R3
C1
IC1
1
12
R12
R11
R10
R9
R4
06
PB30080A
5
8
IC2
4
1
NP C6
R6
TERMINAL PWB ASS'Y
C3
R8
NP
C7
C5
C2
LC3
R5
R1
A.OUT(L)
C4
LC4
2
1
CN3
CN4
6
1
CN2
1
5
R2
A.OUT(R)
A.IN(L)
A.IN(R)
CN1
1
5
8
A

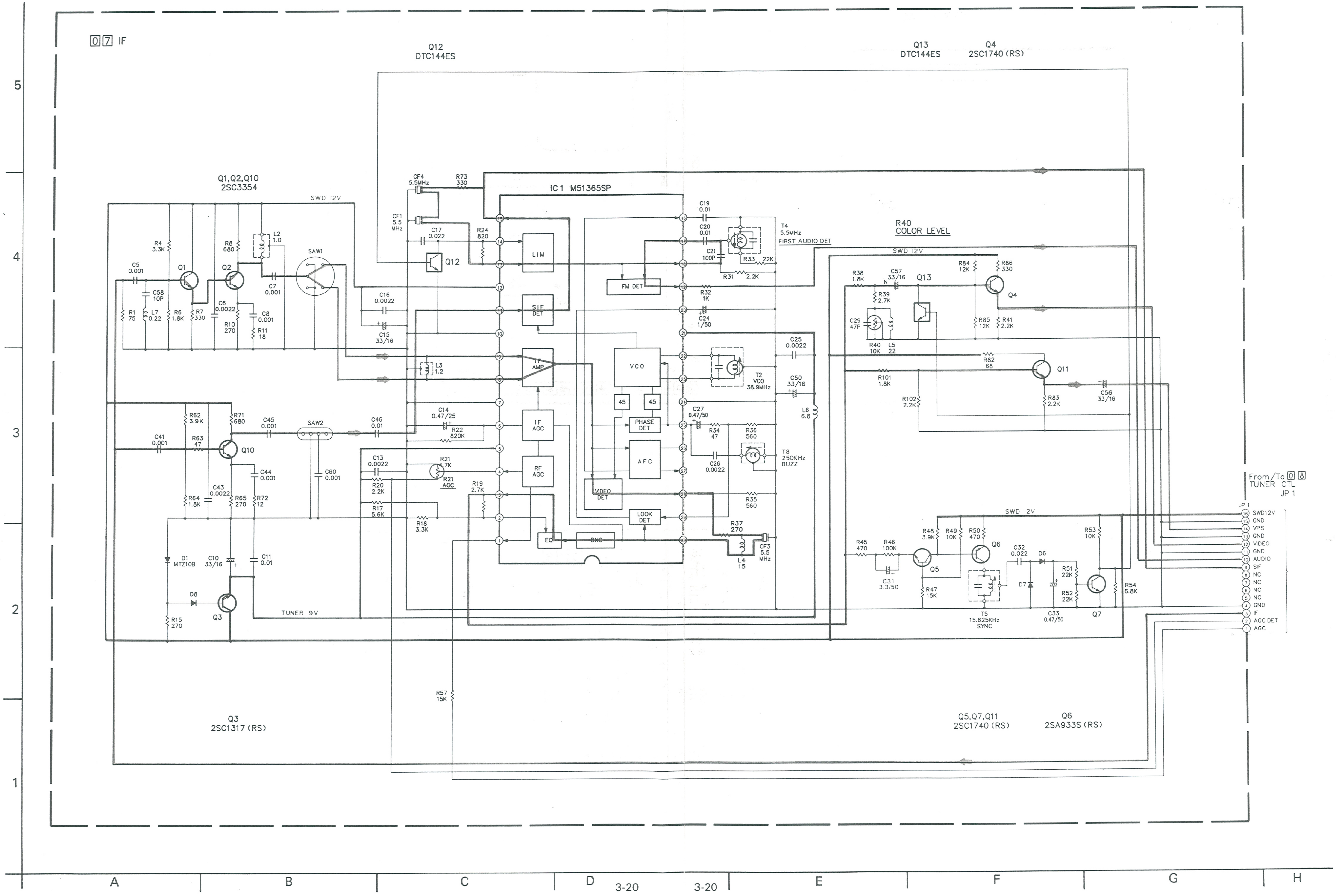
—MIC MIX—


C6
R14
8
R12
3
CN3
1
76
PB30074 A
MIC AMP PWB ASS'Y
ELNA-
437
94V-0
R13
C5
C10
C9
C7
B1
R11
R16
R20
C8
R15
R17
R18
B Q3 E
IC1
1
R19
R10
R7
R9
R8
NP
C2
NP
C1
1
CN2
5
E
B
Q4
C11
R21
7
CN1
1
8
A

5
4
3
2
1

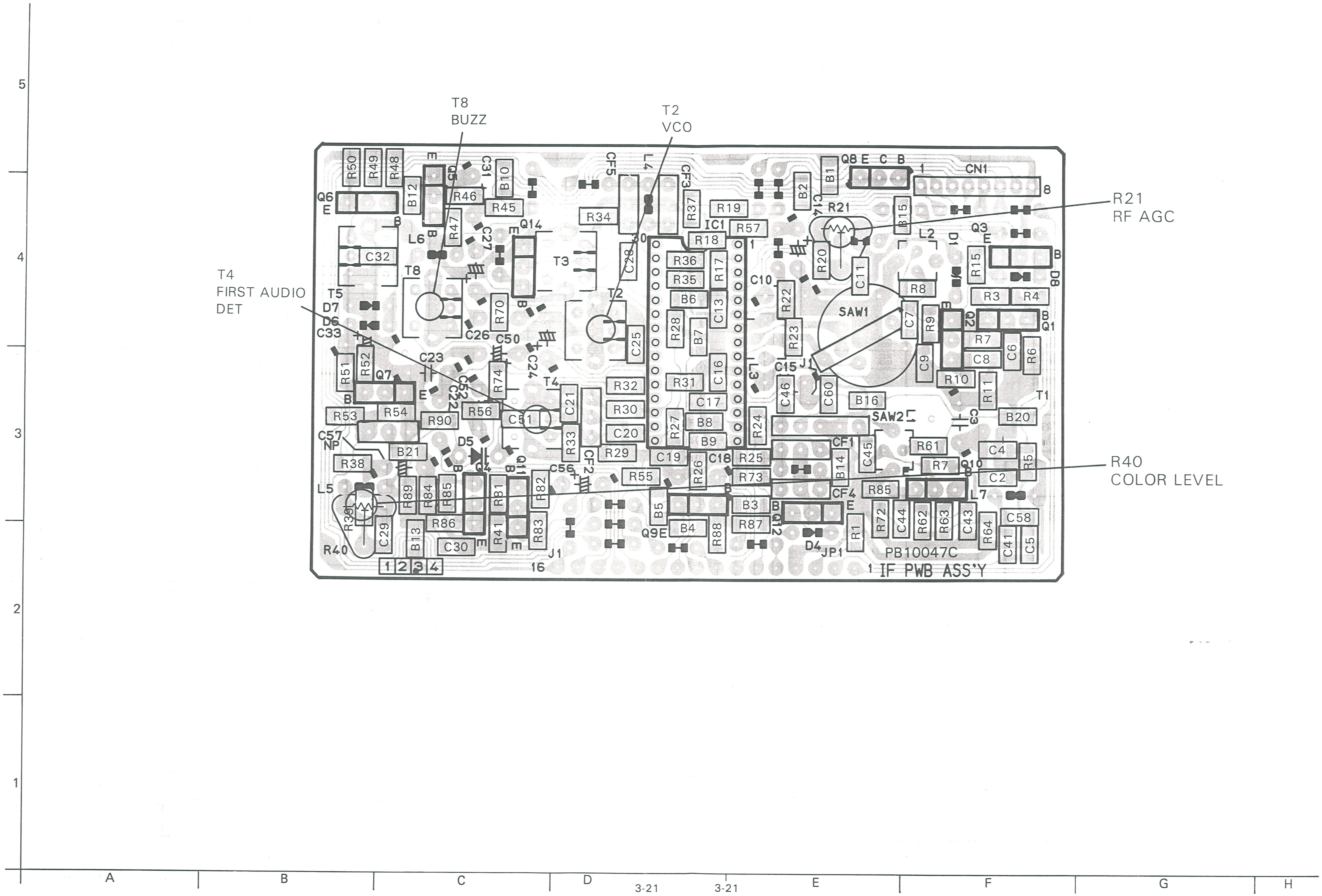
A B C D E F G H

## 3.21 IF SCHEMATIC DIAGRAM



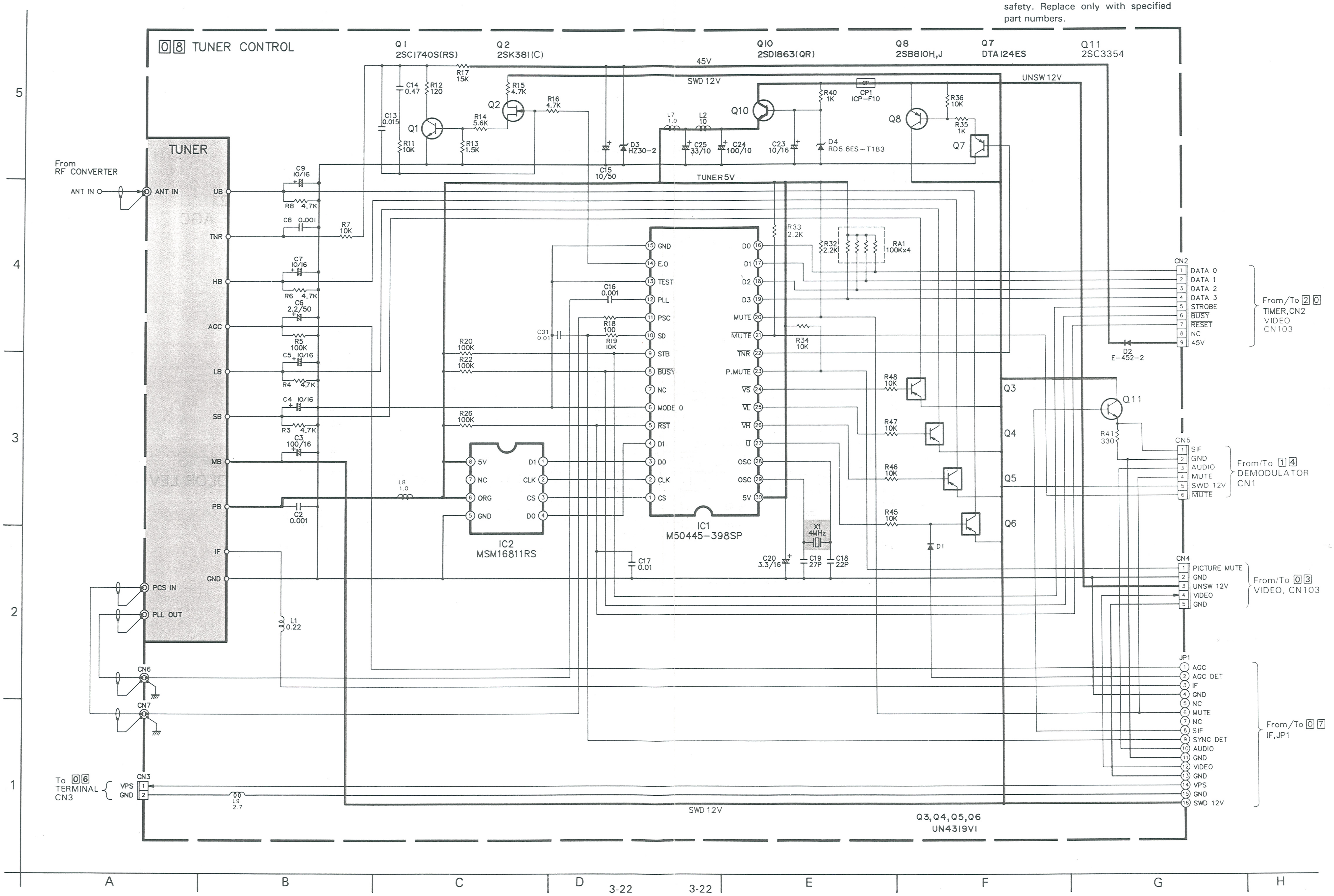
07 IF
Q12 DTC144ES
Q13 DTC144ES
Q4 2SC1740 (RS)
Q1,Q2,Q10 2SC3354
IC1 M51365SP
SWD 12V
CF4 5.5MHz
R73 330
CF1 5.5 MHz
C17 0.022
R24 820
LIM
SIF DET
IF AMP
IF AGC
RF AGC
EQ
BNC
VCO
45
PHASE DET
AFC
VIDEO DET
LOOK DET
FM DET
C19 0.01
C20 0.01
T4 5.5MHz FIRST AUDIO DET
C21 100P
R33 22K
R31 2.2K
R32 1K
C24 1/50
C25 0.0022
T2 VCO 38.9MHz
C50 33/16
L6 6.8
C27 0.47/50
R34 47
R36 560
C26 0.0022
T8 250KHz BUZZ
R35 560
R37 270
CF3 5.5 MHz
L4 15
R40 COLOR LEVEL
R38 1.8K
C57 33/16
R39 2.7K
C29 47P
R40 10K
L5 22
R84 12K
R86 330
R85 12K
R41 2.2K
R82 68
R101 1.8K
R102 2.2K
Q11
R83 2.2K
C56 33/16
R4 3.3K
R8 680
L2 1.0
SAW1
C5 0.001
Q1
Q2
C58 10P
C6 0.0022
C7 0.001
R1 75
L7 0.22
R6 1.8K
R7 330
R10 270
C8 0.001
R11 18
C16 0.0022
C15 33/16
L3 1.2
C14 0.47/25
R22 820K
R62 3.9K
R71 680
C45 0.001
SAW2
C46 0.01
C41 0.001
R63 47
Q10
C44 0.001
C60 0.001
C13 0.0022
R21 4.7K
R21 AGC
R20 2.2K
R19 2.7K
R17 5.6K
R18 3.3K
R64 1.8K
C43 0.0022
R65 270
R72 12
D1 MTZ10B
C10 33/16
C11 0.01
D8
Q3
R15 270
TUNER 9V
R57 15K
R45 470
R46 100K
C31 3.3/50
Q5
R47 15K
R48 3.9K
R49 10K
R50 470
Q6
C32 0.022
D6
D7
R51 22K
R52 22K
C33 0.47/50
T5 15.625KHz SYNC
R53 10K
Q7
R54 6.8K
From/To 08 TUNER CTL JP 1
SWD12V
GND
VPS
GND
VIDEO
GND
AUDIO
SIF
NC
NC
NC
GND
IF
AGC DET
AGC
Q3 2SC1317 (RS)
Q5,Q7,Q11 2SC1740 (RS)
Q6 2SA933S (RS)
1
2
3
4
5
A
B
C
D
E
F
G
H

## 3.22 IF CIRCUIT BOARD


T8
BUZZ
T2
VCO
R21
RF AGC
T4
FIRST AUDIO
DET
R40
COLOR LEVEL
CN1
IC1
SAW1
SAW2
PB10047C
IF PWB ASS'Y
1 2 3 4
5
4
3
2
1
A
B
C
D
E
F
G
H

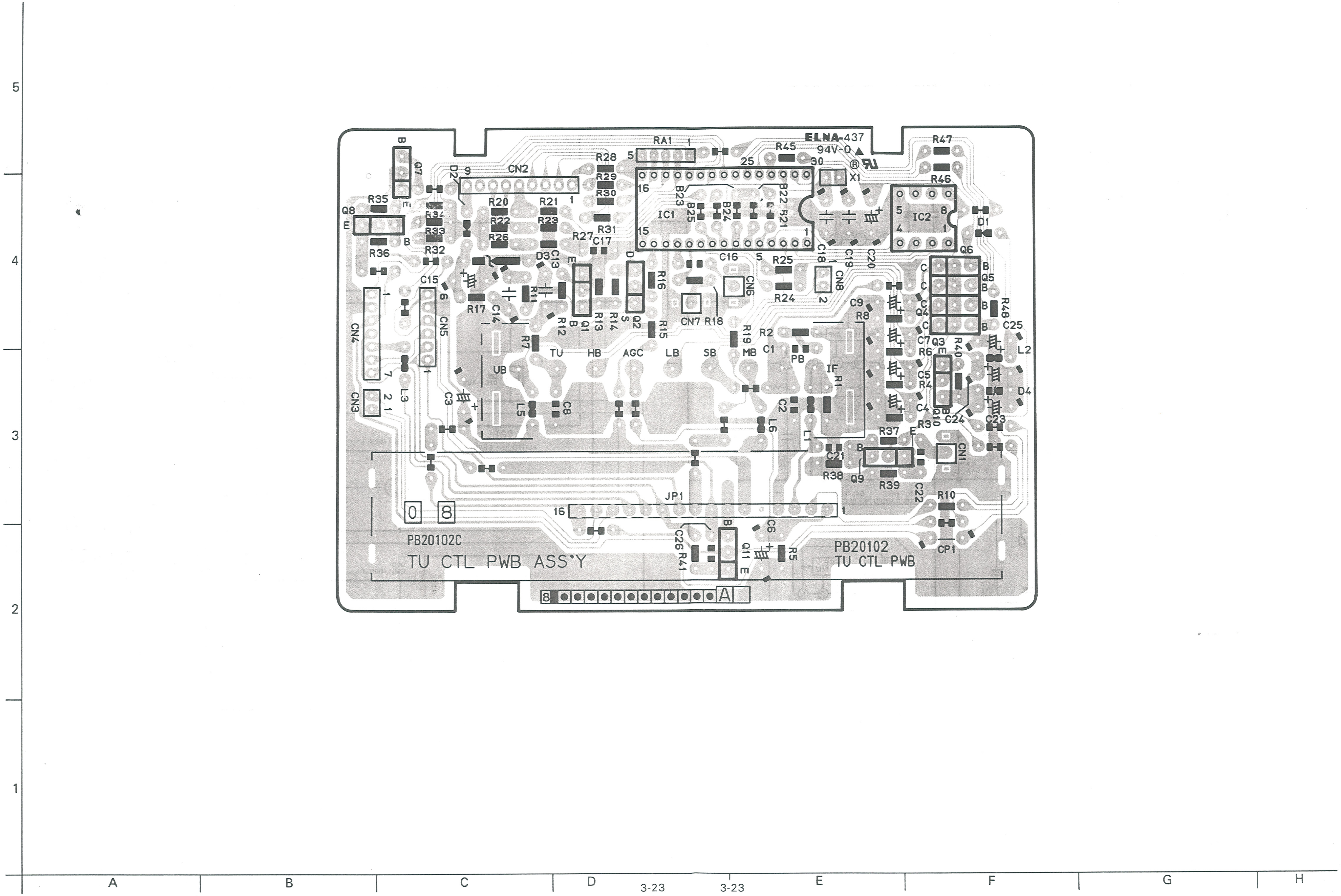
## 3.23 TUNER CONTROL SCHEMATIC DIAGRAM

**NOTE:** Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

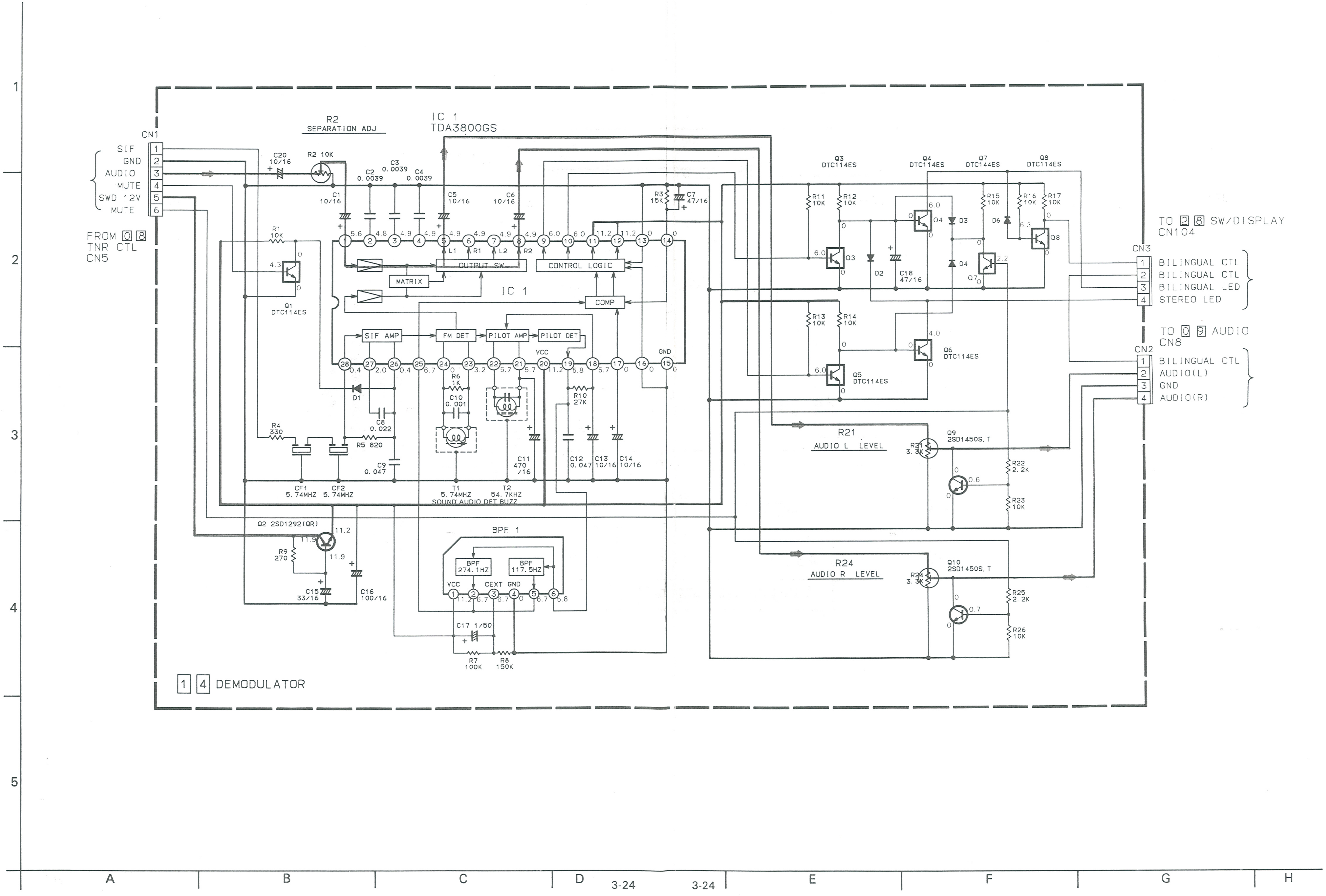


08 TUNER CONTROL
Q1 2SC1740S(RS)
Q2 2SK381(C)
Q10 2SD1863(QR)
Q8 2SB810H,J
Q7 DTA124ES
Q11 2SC3354
45V
SWD 12V
UNSW 12V
TUNER 5V
R17 15K
C14 0.47
R12 120
R15 4.7K
R16 4.7K
C13 0.015
R14 5.6K
R11 10K
R13 1.5K
C15 10/50
D3 HZ30-2
L7 1.0
L2 10
C25 33/10
C24 100/10
C23 10/16
R40 1K
CP1 ICP-F10
D4 RD5.6ES-T1B3
R36 10K
R35 1K
TUNER
From RF CONVERTER
ANT IN
UB
TNR
HB
AGC
LB
SB
MB
PB
IF
GND
PCS IN
PLL OUT
C9 10/16
R8 4.7K
C8 0.001
R7 10K
C7 10/16
R6 4.7K
C6 2.2/50
R5 100K
C5 10/16
R4 4.7K
C4 10/16
R3 4.7K
C3 100/16
C2 0.001
L8 1.0
L1 0.22
R33 2.2K
R32 2.2K
RA1 100K×4
C16 0.001
R18 100
R19 10K
C31 0.01
R20 100K
R22 100K
R26 100K
R34 10K
GND 15
E.O 14
TEST 13
PLL 12
PSC 11
SD 10
STB 9
BUSY 8
NC 7
MODE 0 6
RST 5
D1 4
D0 3
CLK 2
CS 1
D0 16
D1 17
D2 18
D3 19
MUTE 20
MUTE 21
TNR 22
P.MUTE 23
VS 24
VL 25
VH 26
U 27
OSC 28
OSC 29
5V 30
IC1 M50445-398SP
5V 8
NC 7
ORG 6
GND 5
1 D1
2 CLK
3 CS
4 DO
IC2 MSM16811RS
C17 0.01
C20 3.3/16
X1 4MHz
C19 27P
C18 22P
R48 10K
R47 10K
R46 10K
R45 10K
D1
Q3
Q4
Q5
Q6
R41 330
D2 E-452-2
CN2
1 DATA 0
2 DATA 1
3 DATA 2
4 DATA 3
5 STROBE
6 BUSY
7 RESET
8 NC
9 45V
From/To 20 TIMER, CN2 VIDEO CN103
CN5
1 SIF
2 GND
3 AUDIO
4 MUTE
5 SWD 12V
6 MUTE
From/To 14 DEMODULATOR CN1
CN4
1 PICTURE MUTE
2 GND
3 UNSW 12V
4 VIDEO
5 GND
From/To 03 VIDEO, CN103
JP1
1 AGC
2 AGC DET
3 IF
4 GND
5 NC
6 MUTE
7 NC
8 SIF
9 SYNC DET
10 AUDIO
11 GND
12 VIDEO
13 GND
14 VPS
15 GND
16 SWD 12V
From/To 07 IF, JP1
CN6
CN7
CN3
VPS 1
GND 2
To 06 TERMINAL CN3
L9 2.7
SWD 12V
Q3,Q4,Q5,Q6 UN4319VI
5
4
3
2
1
A
B
C
D
E
F
G
H

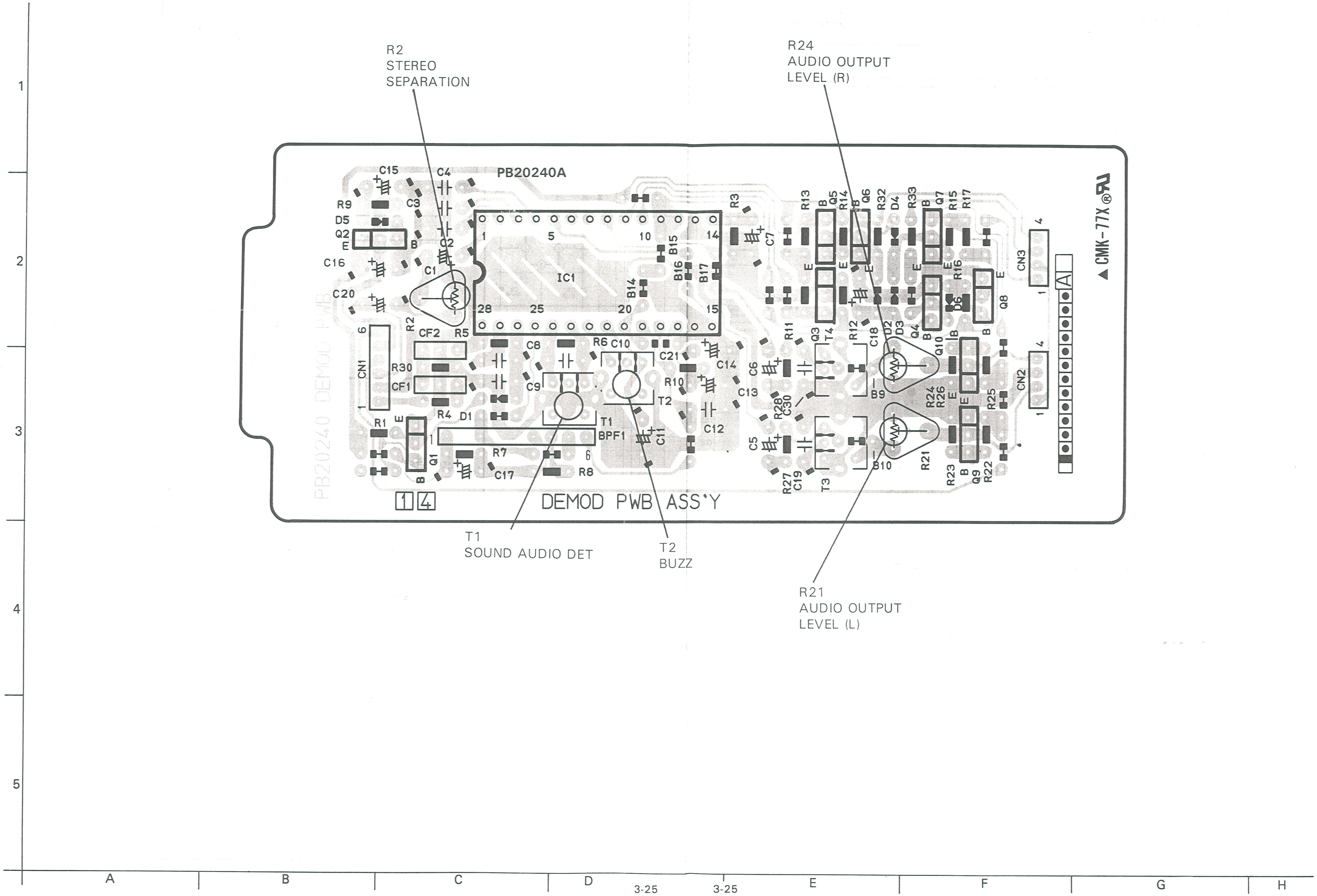
## 3.24 TUNER CONTROL CIRCUIT BOARD


5
4
3
2
1
A
B
C
D
E
F
G
H
ELNA-437
94V-0
RA1
R45
R47
R46
R28
R29
R30
R31
CN2
D2
Q7
Q8
R35
R34
R33
R36
R32
R20
R22
R26
R21
R23
R27
C17
D3
C13
IC1
B23
B25
B24
B22
B21
X1
C18
C19
C20
IC2
D1
Q6
Q5
Q4
Q3
C16
R25
R24
CN6
CN7
R18
CN8
C15
CN4
CN5
CN3
R17
C14
R11
R12
R13
R14
R15
R16
R19
Q1
Q2
R7
TU
HB
AGC
LB
SB
MB
UB
C1
R2
PB
IF
R1
C9
R8
R48
C25
L2
C7
R40
R6
C5
R4
C4
D4
Q10
C24
C23
R3
R37
CN1
C21
R38
Q9
R39
C22
R10
CP1
L3
C3
L5
C8
L6
L1
C2
JP1
C26
R41
Q11
C6
R5
0
8
PB20102C
TU CTL PWB ASS'Y
PB20102
TU CTL PWB

## 3.25 DEMODULATOR SCHEMATIC DIAGRAM


CN1
SIF 1
GND 2
AUDIO 3
MUTE 4
SWD 12V 5
MUTE 6
FROM 0 8 TNR CTL CN5
R2 SEPARATION ADJ
IC 1 TDA3800GS
C20 10/16
R2 10K
C2 0.0039
C3 0.0039
C4 0.0039
C1 10/16
C5 10/16
C6 10/16
R3 15K
C7 47/16
R1 10K
Q1 DTC114ES
OUTPUT SW
CONTROL LOGIC
MATRIX
IC 1
COMP
SIF AMP
FM DET
PILOT AMP
PILOT DET
VCC
GND
L1 R1 L2 R2
D1
R6 1K
C10 0.001
R10 27K
C8 0.022
R4 330
R5 820
C9 0.047
C11 470/16
C12 0.047
C13 10/16
C14 10/16
CF1 5.74MHZ
CF2 5.74MHZ
T1 5.74MHZ
T2 54.7KHZ
SOUND AUDIO DET BUZZ
Q2 2SD1292(QR)
R9 270
C15 33/16
C16 100/16
BPF 1
BPF 274.1HZ
BPF 117.5HZ
VCC CEXT GND
C17 1/50
R7 100K
R8 150K
1 4 DEMODULATOR
Q3 DTC114ES
Q4 DTC114ES
Q7 DTC144ES
Q8 DTC114ES
R11 10K
R12 10K
R13 10K
R14 10K
R15 10K
R16 10K
R17 10K
D2 D3 D4 D6
C18 47/16
Q5 DTC114ES
Q6 DTC114ES
TO 2 8 SW/DISPLAY CN104
CN3
1 BILINGUAL CTL
2 BILINGUAL CTL
3 BILINGUAL LED
4 STEREO LED
TO 0 9 AUDIO CN8
CN2
1 BILINGUAL CTL
2 AUDIO(L)
3 GND
4 AUDIO(R)
R21 AUDIO L LEVEL
R21 3.3K
Q9 2SD1450S.T
R22 2.2K
R23 10K
R24 AUDIO R LEVEL
R24 3.3K
Q10 2SD1450S.T
R25 2.2K
R26 10K
1 2 3 4 5
A B C D E F G H

## 3.26 DEMODULATOR CIRCUIT BOARD


PB20240A
IC1
DEMOD PWB ASS'Y
PB20240 DEMOD PWB
CMK-77X
CN1
CN2
CN3
CF1
CF2
BPF1
T1
T2
T3
T4
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
D1
D2
D3
D4
D5
D6
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R21
R22
R23
R24
R25
R26
R27
R28
R30
R32
R33
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C30
B9
B10
B14
B15
B16
B17
1
2
3
4
5
A
B
C
D
E
F
G
H

R2
STEREO
SEPARATION

R24
AUDIO OUTPUT
LEVEL (R)

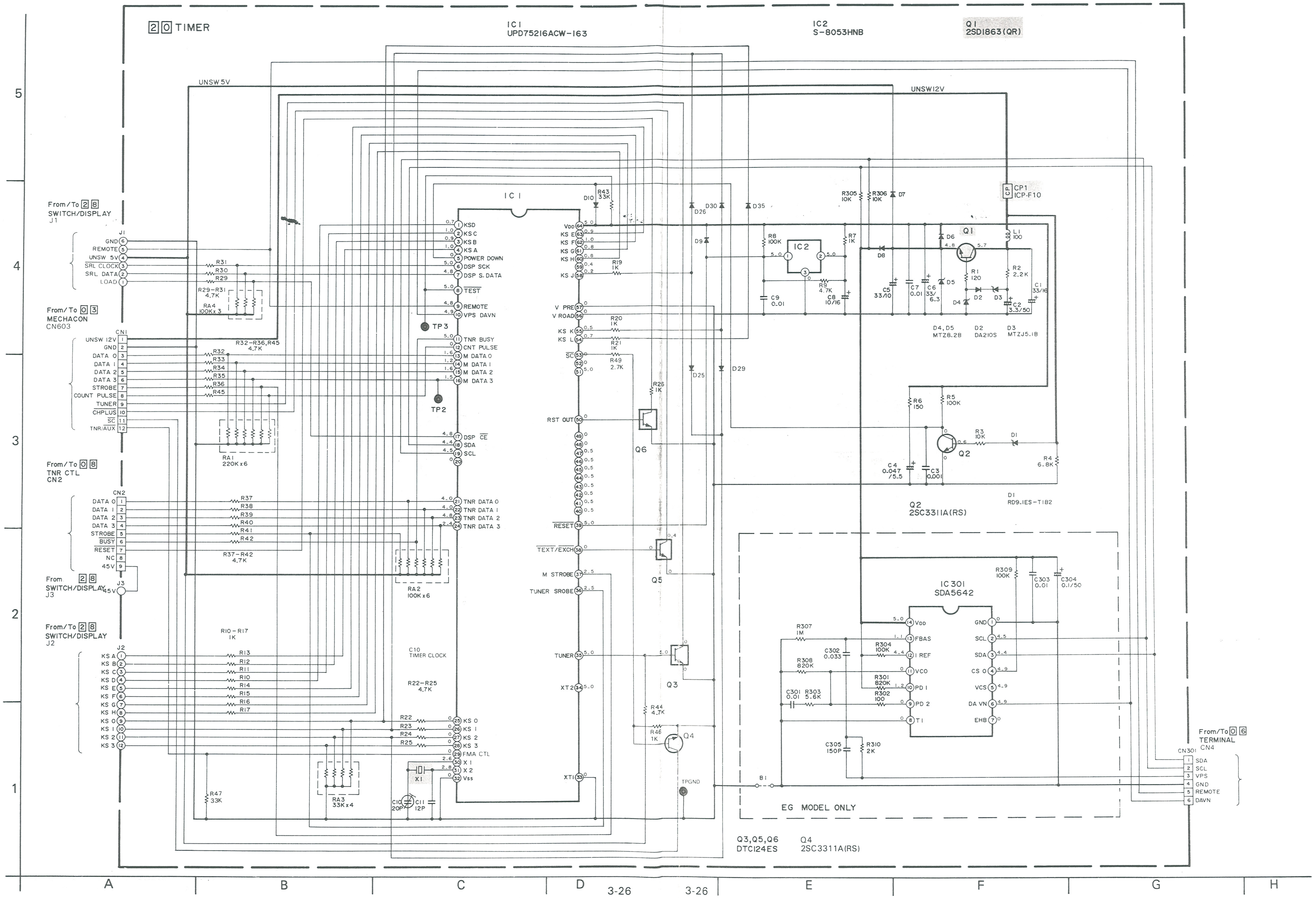
T1
SOUND AUDIO DET

T2
BUZZ

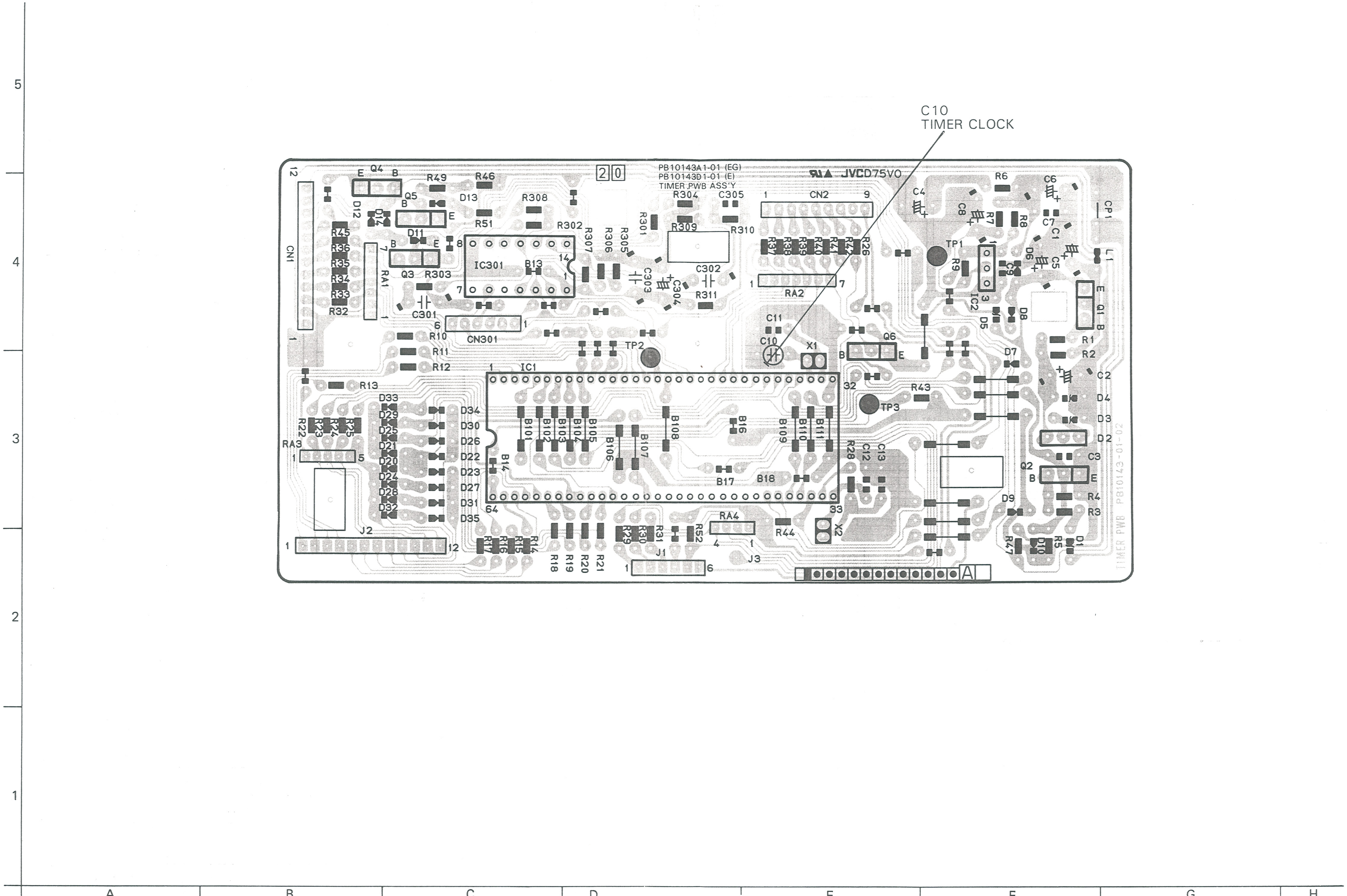
R21
AUDIO OUTPUT
LEVEL (L)

## 3.27 TIMER SCHEMATIC DIAGRAM

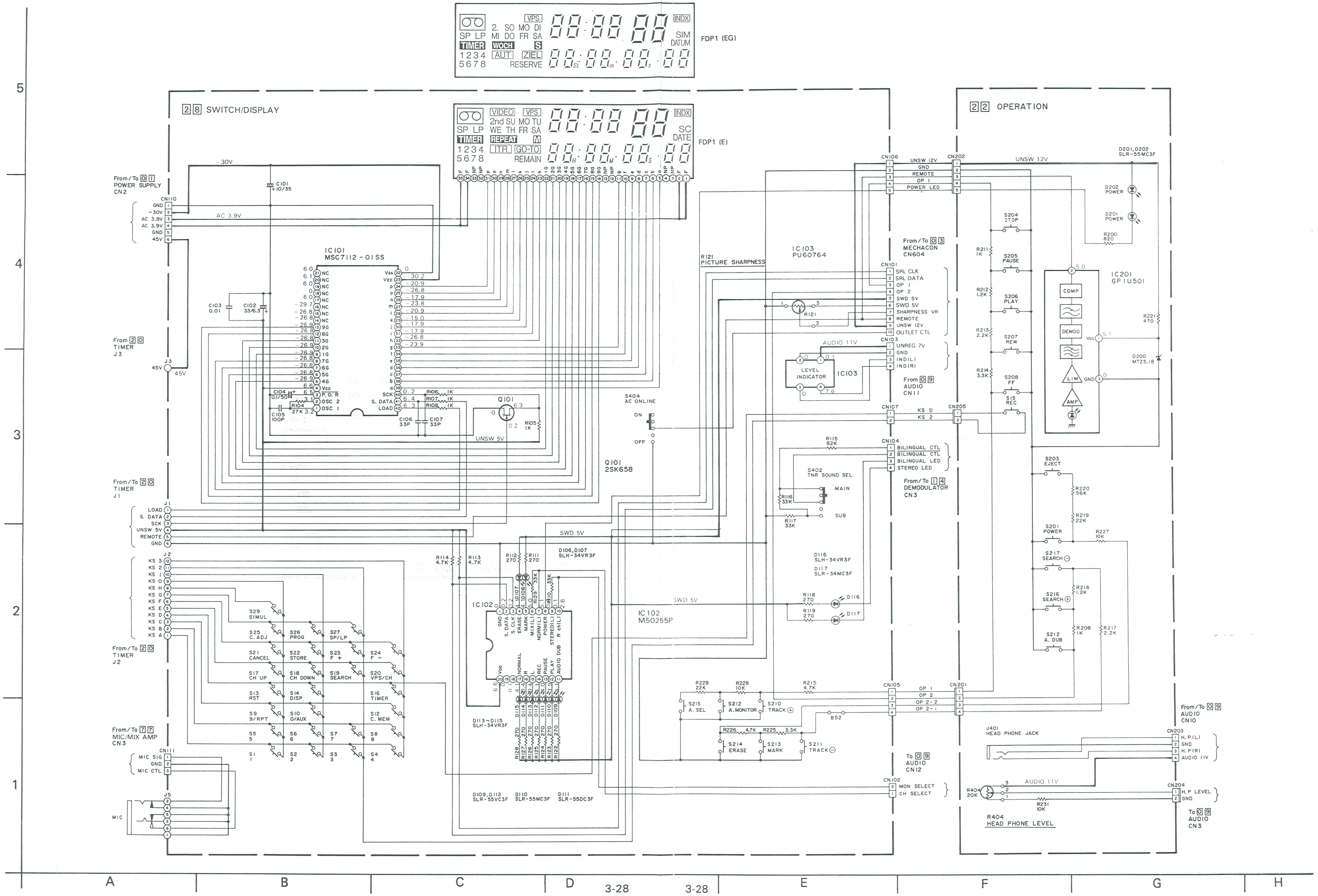
**NOTE:** Shaded (▒) parts are critical for safety. Replace only with specified part numbers.


20 TIMER
IC1
UPD75216ACW-163
IC2
S-8053HNB
Q1
2SD1863(QR)
UNSW 5V
UNSW12V
From/To 28
SWITCH/DISPLAY
J1
GND
REMOTE
UNSW 5V
SRL CLOCK
SRL DATA
LOAD
From/To 03
MECHACON
CN603
CN1
UNSW 12V
GND
DATA 0
DATA 1
DATA 2
DATA 3
STROBE
COUNT PULSE
TUNER
CHPLUS
SC
TNR/AUX
From/To 08
TNR CTL
CN2
DATA 0
DATA 1
DATA 2
DATA 3
STROBE
BUSY
RESET
NC
45V
From 28
SWITCH/DISPLAY
J3
45V
From/To 28
SWITCH/DISPLAY
J2
KS A
KS B
KS C
KS D
KS E
KS F
KS G
KS H
KS 0
KS 1
KS 2
KS 3
R31
R30
R29
R29-R31
4.7K
RA4
100K x 3
R32-R36,R45
4.7K
R32
R33
R34
R35
R36
R45
RA1
220K x 6
R37
R38
R39
R40
R41
R42
R37-R42
4.7K
RA2
100K x 6
R10-R17
1K
R13
R12
R11
R10
R14
R15
R16
R17
R47
33K
RA3
33K x 4
C10
TIMER CLOCK
R22-R25
4.7K
R22
R23
R24
R25
X1
C10
20P
C11
12P
TP3
TP2
KSD
KSC
KSB
KSA
POWER DOWN
DSP SCK
DSP S.DATA
TEST
REMOTE
VPS DAVN
TNR BUSY
CNT PULSE
M DATA 0
M DATA 1
M DATA 2
M DATA 3
DSP CE
SDA
SCL
TNR DATA 0
TNR DATA 1
TNR DATA 2
TNR DATA 3
KS 0
KS 1
KS 2
KS 3
FMA CTL
X 1
X 2
Vss
VDD
KS E
KS F
KS G
KS H
KS J
V PRE
V ROAD
KS K
KS L
SC
RST OUT
RESET
TEXT/EXCH
M STROBE
TUNER SROBE
TUNER
XT2
XT1
D10
R43
33K
R19
1K
R20
1K
R21
1K
R49
2.7K
D26
D30
D35
D9
D25
D29
R26
1K
Q6
Q5
Q3
Q4
R44
4.7K
R46
1K
TPGND
R305
10K
R306
10K
D7
CP1
ICP-F10
R8
100K
IC2
R7
1K
D8
D6
Q1
L1
100
R9
4.7K
C9
0.01
C8
10/16
C5
33/10
C7
0.01
C6
33/6.3
D5
D4
D2
D3
R1
120
R2
2.2K
C1
33/16
C2
3.3/50
D4, D5
MTZ8.2B
D2
DA210S
D3
MTZJ5.1B
R6
150
R5
100K
R3
10K
D1
Q2
R4
6.8K
C4
0.047/5.5
C3
0.001
Q2
2SC3311A(RS)
D1
RD9.1ES-T1B2
IC301
SDA5642
R309
100K
C303
0.01
C304
0.1/50
R307
1M
C302
0.033
R304
100K
R308
820K
R301
820K
R302
100
C301
0.01
R303
5.6K
C305
150P
R310
2K
VDD
FBAS
I REF
VCO
PD 1
PD 2
TI
GND
SCL
SDA
CS 0
VCS
DA VN
EHB
B1
EG MODEL ONLY
From/To 06
TERMINAL
CN4
CN301
SDA
SCL
VPS
GND
REMOTE
DAVN
Q3,Q5,Q6
DTC124ES
Q4
2SC3311A(RS)
A
B
C
D
E
F
G
H
1
2
3
4
5

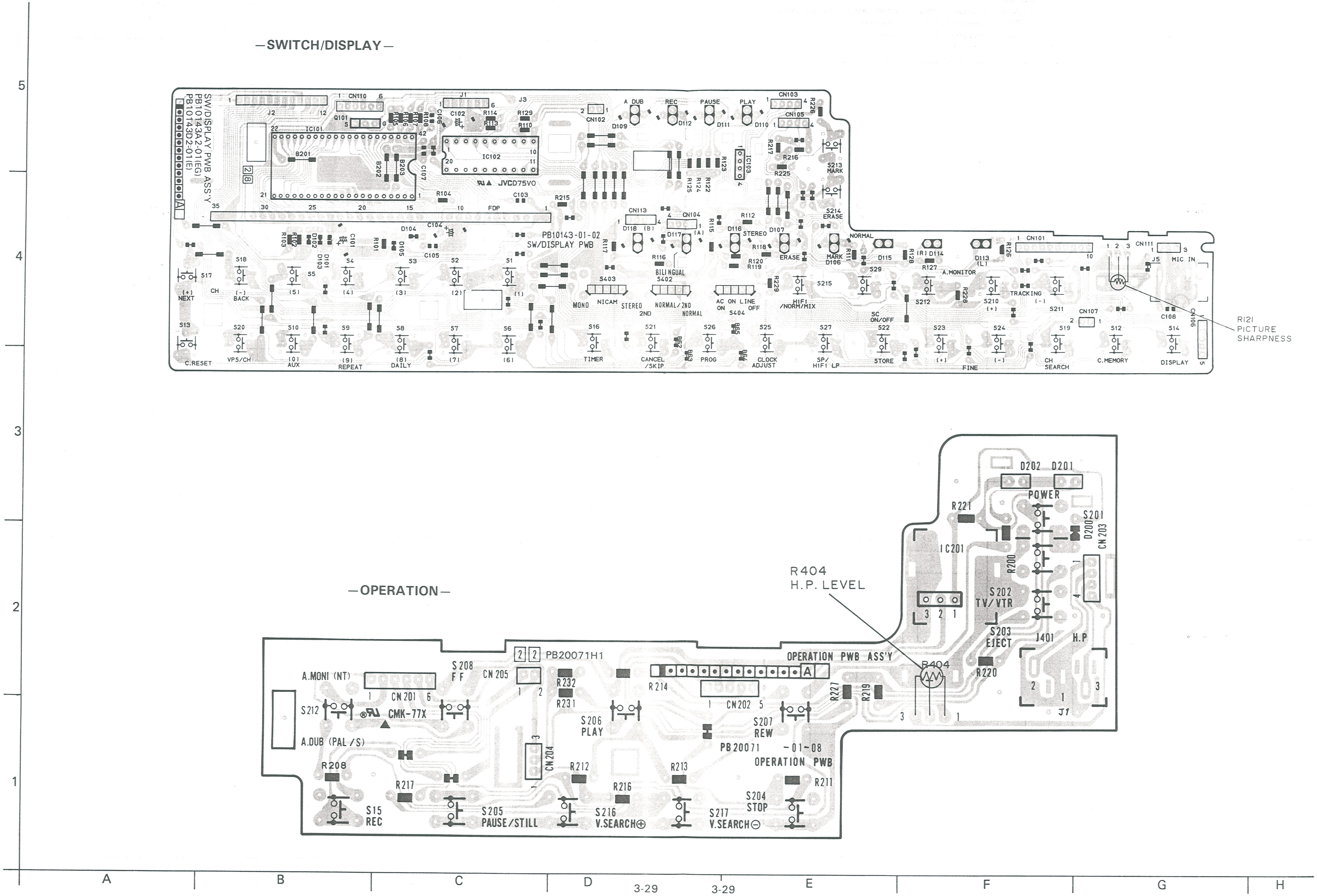
## 3.28 TIMER CIRCUIT BOARD


C10
TIMER CLOCK
PB10143A1-01 (EG)
PB10143D1-01 (E)
TIMER PWB ASS'Y
JVC D75V0
TIMER PWB PB10143-01-02
IC1
IC301
IC2
CN1
CN2
CN301
J1
J2
J3
RA1
RA2
RA3
RA4
X1
X2
TP1
TP2
TP3
Q1
Q2
Q3
Q4
Q5
Q6
CP1
L1
A
B
C
D
E
F
G
H
1
2
3
4
5

## 3.29 SWITCH/DISPLAY AND OPERATION SCHEMATIC DIAGRAMS

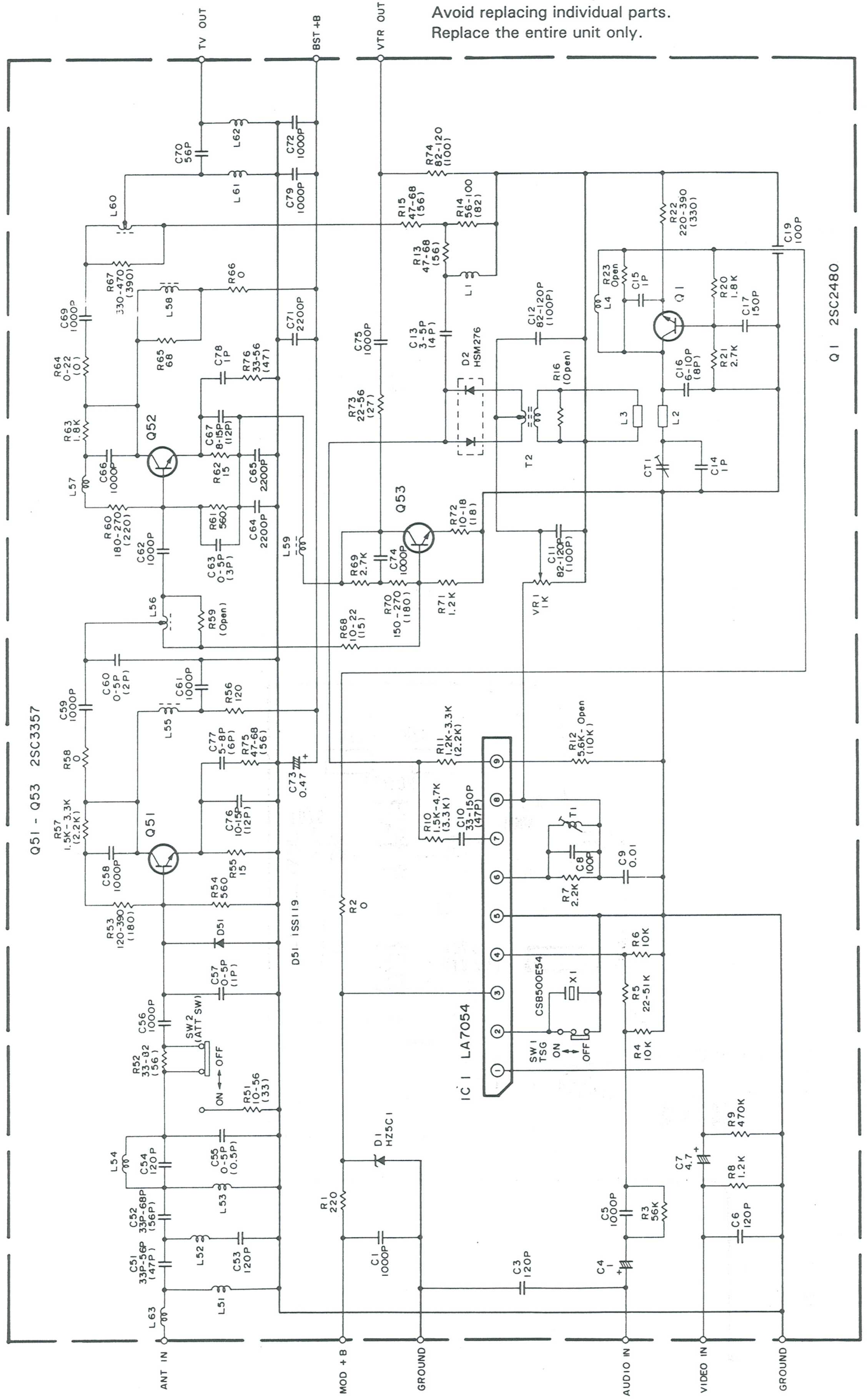

FDP1 (EG)
VPS
INDX
SP LP
2. SO MO DI
MI DO FR SA
SIM
DATUM
TIMER
WOCH
S
1234
5678
AUT
ZIEL
RESERVE
28 SWITCH/DISPLAY
FDP1 (E)
VIDEO
2nd SU MO TU
WE TH FR SA
SC
DATE
REPEAT
M
ITR
GO-TO
REMAIN
22 OPERATION
From/To 01 POWER SUPPLY CN2
CN110
GND
-30V
AC 3.9V
AC 3.9V
GND
45V
-30V
C101 10/35
AC 3.9V
IC101 MSC7112-01SS
C103 0.01
C102 33/6.3
From 20 TIMER J3
45V
J3
C104 0.1/50
C105 100P
R104 27K
C106 33P
C107 33P
R106 1K
R107 1K
R108 1K
Q101
R105 1K
UNSW 5V
Q101 2SK658
From/To 20 TIMER J1
J1
LOAD
S. DATA
SCK
UNSW 5V
REMOTE
GND
J2
KS 3
KS 2
KS 1
KS 0
KS H
KS G
KS F
KS E
KS D
KS C
KS B
KS A
From/To 20 TIMER J2
S29 SIMUL
S25 C. ADJ
S26 PROG
S27 SP/LP
S21 CANCEL
S22 STORE
S23 F +
S24 F −
S17 CH UP
S18 CH DOWN
S19 SEARCH
S20 VPS/CH
S13 RST
S14 DISP
S16 TIMER
S9 9/RPT
S10 0/AUX
S12 C. MEM
S5 5
S6 6
S7 7
S8 8
S1 1
S2 2
S3 3
S4 4
From/To 77 MIC/MIX AMP CN3
CN111
MIC SIG
GND
MIC CTL
J5
MIC
R114 4.7K
R113 4.7K
R112 270
R111 270
D106, D107 SLH-34VR3F
SWD 5V
IC102
IC102 M50255P
D113~D115 SLH-34VR3F
D109, D112 SLR-55VC3F
D110 SLR-55MC3F
D111 SLR-55DC3F
S404 AC ONLINE
ON
OFF
R121 PICTURE SHARPNESS
IC103 PU60764
R121
AUDIO 11V
LEVEL INDICATOR
IC103
R115 82K
S402 TNR SOUND SEL
MAIN
SUB
R116 33K
R117 33K
D116 SLH-34VR3F
D117 SLR-34MC3F
R118 270
R119 270
D116
D117
R229 22K
R228 10K
R215 4.7K
S215 A. SEL
S212 A. MONITOR
S210 TRACK ⊕
R226 4.7K
R225 3.3K
S214 ERASE
S213 MARK
S211 TRACK ⊖
B52
CN106
UNSW 12V
GND
REMOTE
OP 1
POWER LED
CN202
From/To 03 MECHACON CN604
CN101
SRL CLK
SRL DATA
OP 1
OP 2
SWD 5V
SWD 5V
SHARPNESS VR
REMOTE
UNSW 12V
OUTLET CTL
CN103
UNREG 7V
GND
IND(L)
IND(R)
From 09 AUDIO CN11
CN107
KS D
KS 2
CN205
CN104
BILINGUAL CTL
BILINGUAL CTL
BILINGUAL LED
STEREO LED
From/To 14 DEMODULATOR CN3
CN105
CN201
OP 1
OP 2
OP 2-2
OP 2-1
To 09 AUDIO CN12
CN102
MON SELECT
CH SELECT
UNSW 12V
D201, D202 SLR-55MC3F
D202 POWER
D201 POWER
R200 820
S204 STOP
S205 PAUSE
S206 PLAY
S207 REW
S208 FF
S15 REC
R211 1K
R212 1.2K
R213 2.2K
R214 3.3K
IC201 GP1U501
COMP
DEMOD
LIM
AMP
Vcc
GND
R221 470
D200 MTZ5.1B
S203 EJECT
R220 56K
R219 22K
S201 POWER
R227 10K
S217 SEARCH ⊖
S216 SEARCH ⊕
R216 1.2K
R208 1K
R217 2.2K
S212 A. DUB
From/To 09 AUDIO CN10
J401 HEAD PHONE JACK
CN203
H. P(L)
GND
H. P(R)
AUDIO 11V
R404 20K
R231 10K
AUDIO 11V
CN204
H.P LEVEL
GND
R404 HEAD PHONE LEVEL
To 09 AUDIO CN3
1
2
3
4
5
A
B
C
D
E
F
G
H

## 3.30 SWITCH/DISPLAY AND OPERATION CIRCUIT BOARDS


—SWITCH/DISPLAY—
SW/DISPLAY PWB ASS'Y
PB10143A2-01(EG)
PB10143D2-01(E)
PB10143-01-02
SW/DISPLAY PWB
IC101
IC102
IC103
JVCD75VO
FDP
J1
J2
J3
J5
CN101
CN102
CN103
CN104
CN105
CN107
CN110
CN111
CN113
CN106
Q101
B201
B202
B203
A DUB
REC
PAUSE
PLAY
S213 MARK
S214 ERASE
NORMAL
STEREO
ERASE
MARK
A.MONITOR
TRACKING
MIC IN
R121
PICTURE
SHARPNESS
S17 (+) NEXT
CH
S18 (-) BACK
S5 (5)
S4 (4)
S3 (3)
S2 (2)
S1 (1)
S403 MONO NICAM STEREO 2ND
S402 BILINGUAL NORMAL/2ND NORMAL
S404 AC ON LINE ON OFF
S215 HIFI /NORM/MIX
S29
S212
S210 (+)
S211 (-)
SC ON/OFF
S13 C.RESET
S20 VPS/CH
S10 (0) AUX
S9 (9) REPEAT
S8 (8) DAILY
S7 (7)
S6 (6)
S16 TIMER
S21 CANCEL /SKIP
S26 PROG
S25 CLOCK ADJUST
S27 SP/ HIFI LP
S22 STORE
S23 (+)
FINE
S24 (-)
S19 CH SEARCH
S12 C.MEMORY
S14 DISPLAY
—OPERATION—
PB20071H1
OPERATION PWB ASS'Y
PB20071 -01-08
OPERATION PWB
A.MONI (NT)
A.DUB (PAL/S)
S212
S208 FF
CN205
CN201
CMK-77X
CN202
CN204
CN203
R232
R231
R214
S206 PLAY
S207 REW
R208
R217
R212
R216
R213
R211
S15 REC
S205 PAUSE/STILL
S216 V.SEARCH⊕
S217 V.SEARCH⊖
S204 STOP
R227
R219
R404
H.P. LEVEL
R220
R221
R200
IC201
D202
D201
POWER
S201
D200
S202 TV/VTR
S203 EJECT
J401
H.P
J1
A
B
C
D
E
F
G
H
1
2
3
4
5

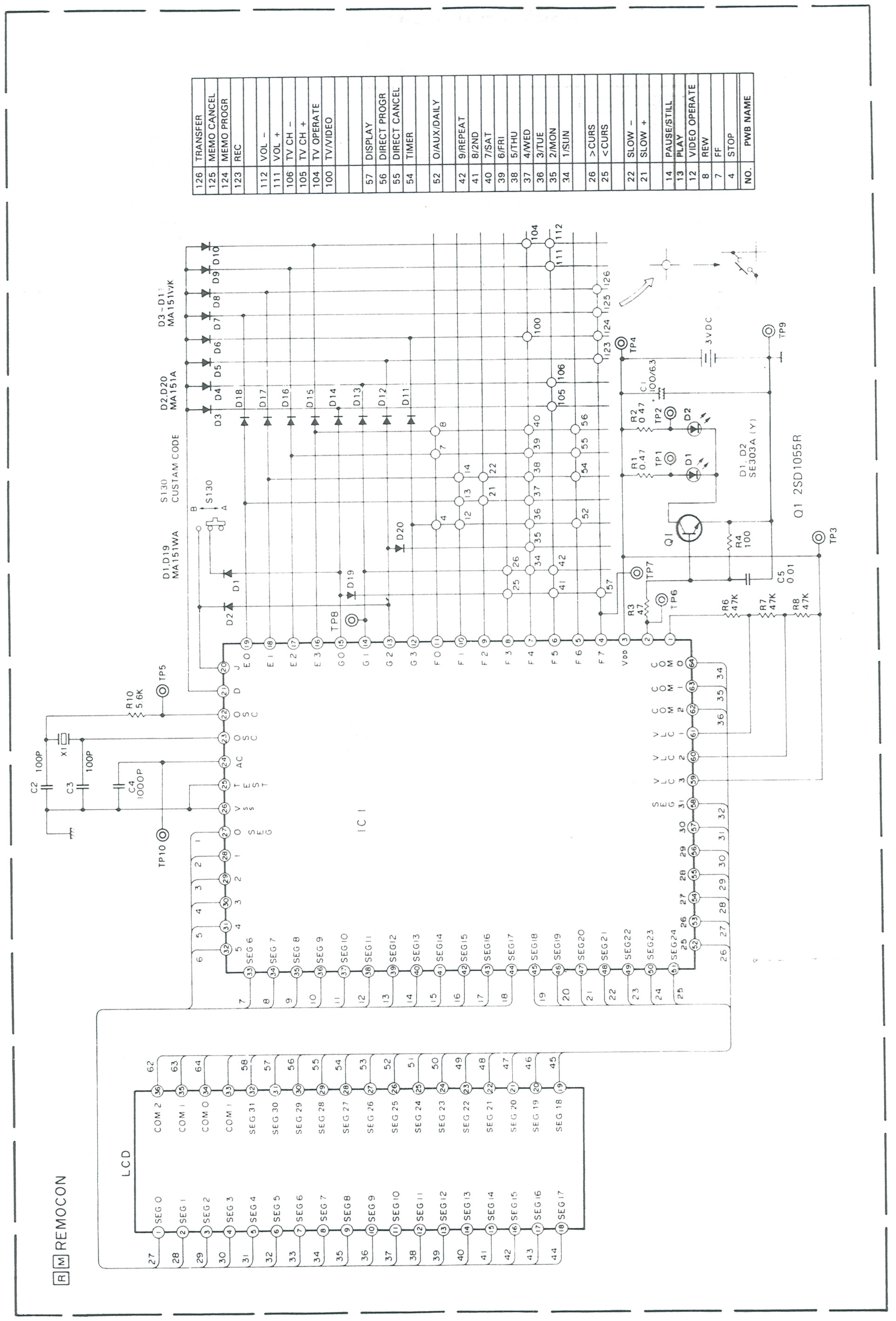
## 3.31 RF CONVERTOR AND MIX BOOSTER SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.


TV OUT
BST +B
VTR OUT
Q1 2SC2480
Q51 - Q53 2SC3357
D51 1SS119
IC1 LA7054
CSB500E54
SW1 TSG
SW2 (ATT SW)
ON ↔ OFF
D1 HZ5C1
VR1 1K
T1
T2
D2 HSM276
ANT IN
MOD +B
GROUND
AUDIO IN
VIDEO IN
GROUND

## 3.32 REMOTE CONTROL SCHEMATIC DIAGRAM

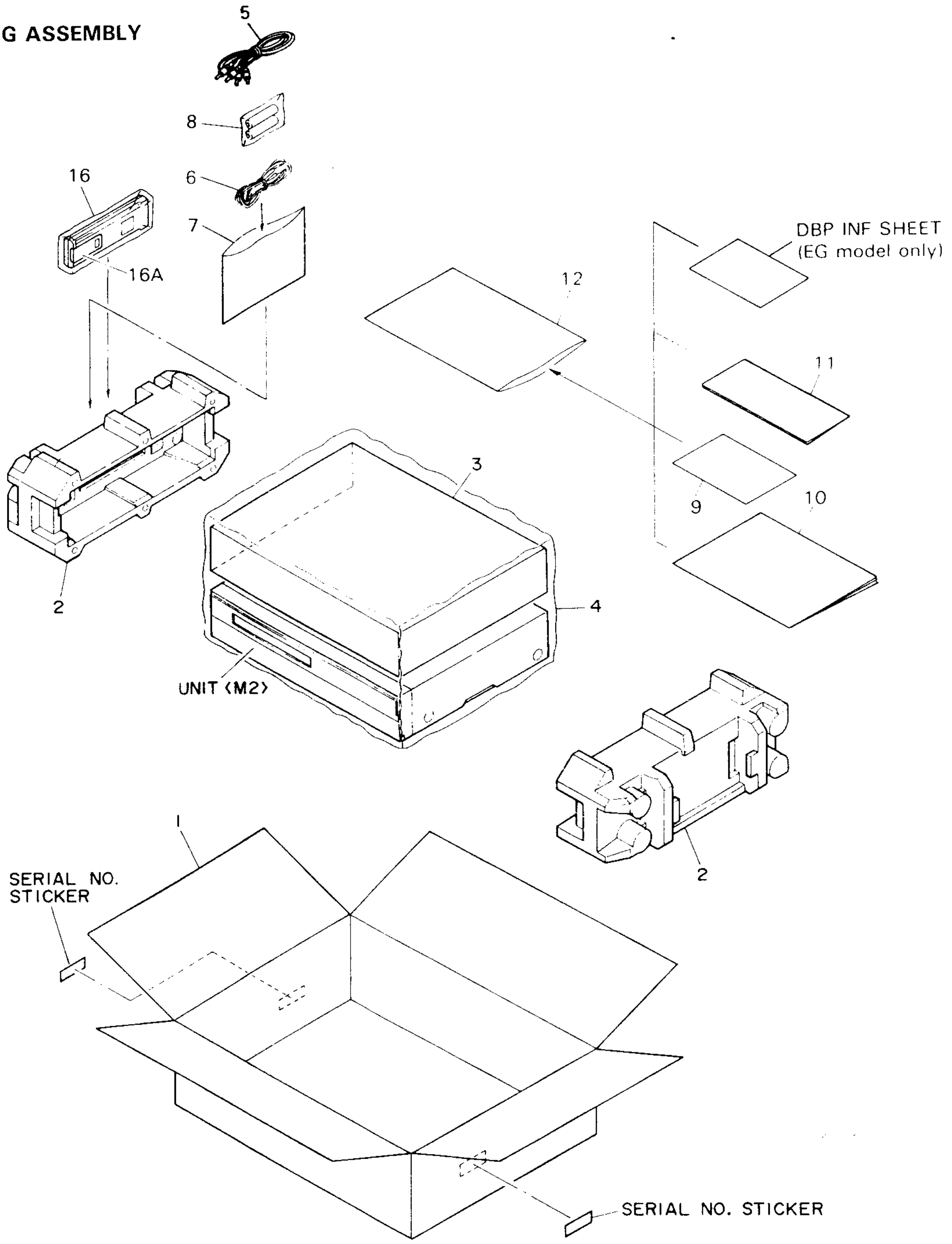
NOTES: 1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entrie unit only.


D3 - D11 MA151VK
D2, D20 MA151A
S130 CUSTAM CODE
D1, D19 MA151WA
3VDC
D1, D2 SE303A (Y)
Q1 2SD1055R
IC1
LCD
RM REMOCON

| NO. | PWB NAME |
|---|---|
| 4 | STOP |
| 7 | FF |
| 8 | REW |
| 12 | VIDEO OPERATE |
| 13 | PLAY |
| 14 | PAUSE/STILL |
| | |
| 21 | SLOW + |
| 22 | SLOW − |
| | |
| 25 | <CURS |
| 26 | >CURS |
| | |
| 34 | 1/SUN |
| 35 | 2/MON |
| 36 | 3/TUE |
| 37 | 4/WED |
| 38 | 5/THU |
| 39 | 6/FRI |
| 40 | 7/SAT |
| 41 | 8/2ND |
| 42 | 9/REPEAT |
| | |
| 52 | O/AUX/DAILY |
| | |
| 54 | TIMER |
| 55 | DIRECT CANCEL |
| 56 | DIRECT PROGR |
| 57 | DISPLAY |
| | |
| | |
| 100 | TV/VIDEO |
| 104 | TV OPERATE |
| 105 | TV CH + |
| 106 | TV CH − |
| 111 | VOL + |
| 112 | VOL − |
| | |
| 123 | REC |
| 124 | MEMO PROGR |
| 125 | MEMO CANCEL |
| 126 | TRANSFER |

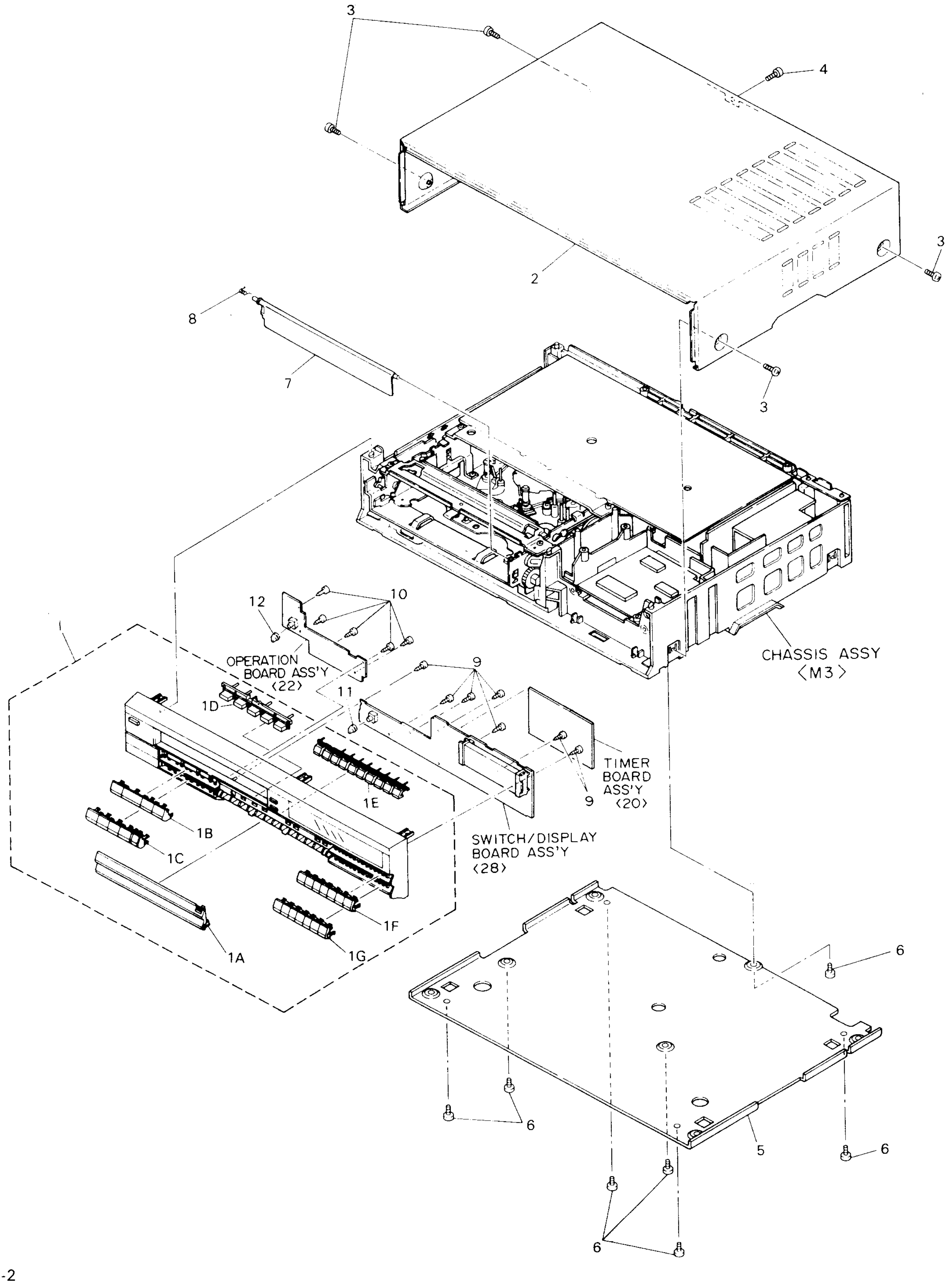
# SECTION 4
# EXPLODED VIEWS AND PARTS LIST

## 4.1 PACKING ASSEMBLY


5
8
16
6
7
16A
12
DBP INF SHEET
(EG model only)
11
3
9
10
2
4
UNIT <M2>
1
SERIAL NO.
STICKER
2
SERIAL NO. STICKER

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | | | * 1. PACKING ASSEMBLY <M1> * |
| | 1 | PQ31705-186 | PACKING CASE ,E |
| | | PQ31705-179 | PACKING CASE, EG |
| | 2 | PQ31996F-3 | CUSHION ASSY |
| | 3 | PQ41026-10 | PROTECT SHEET |
| | 4 | PQM30021-59-11 | POLY BAG |
| | 5 | PU56142-3 | PIN CORD ASSY |
| ⚠ | 6 | PU59168-3 | RF CABLE |
| ⚠ | | OR PU59167-3 | RF CABLE |
| | 7 | QPGA020-02003 | POLY BAG |
| | 8 | UM-3DJ2P | BATTERY |
| | 9 | BT-20069A | WARRANTY CARD. EG |
| ⚠ | 10 | PU30425-995 | INSTRUCTIONS,E |
| ⚠ | | PU30425-993 | INSTRUCTIONS, EG |
| | 11 | TCN-3379 | TAPE CATALOG |
| | 12 | QPGA025-03505 | POLY BAG |
| ⚠ | 16 | PQ10543BD | REMOTE CONTROLLER,E |
| ⚠ | | PQ10543BB-33 | REMOTE CONTROLLER,EG |
| | 16A | PQ31449 | BATTERY CAP |

## 4.2 CABINET ASSEMBLY <M2>


3
4
3
2
3
8
7
10
12
OPERATION BOARD ASS'Y <22>
9
11
1
1D
1E
TIMER BOARD ASS'Y <20>
9
1B
1C
SWITCH/DISPLAY BOARD ASS'Y <28>
CHASSIS ASSY <M3>
1F
1A
1G
6
6
5
6
6

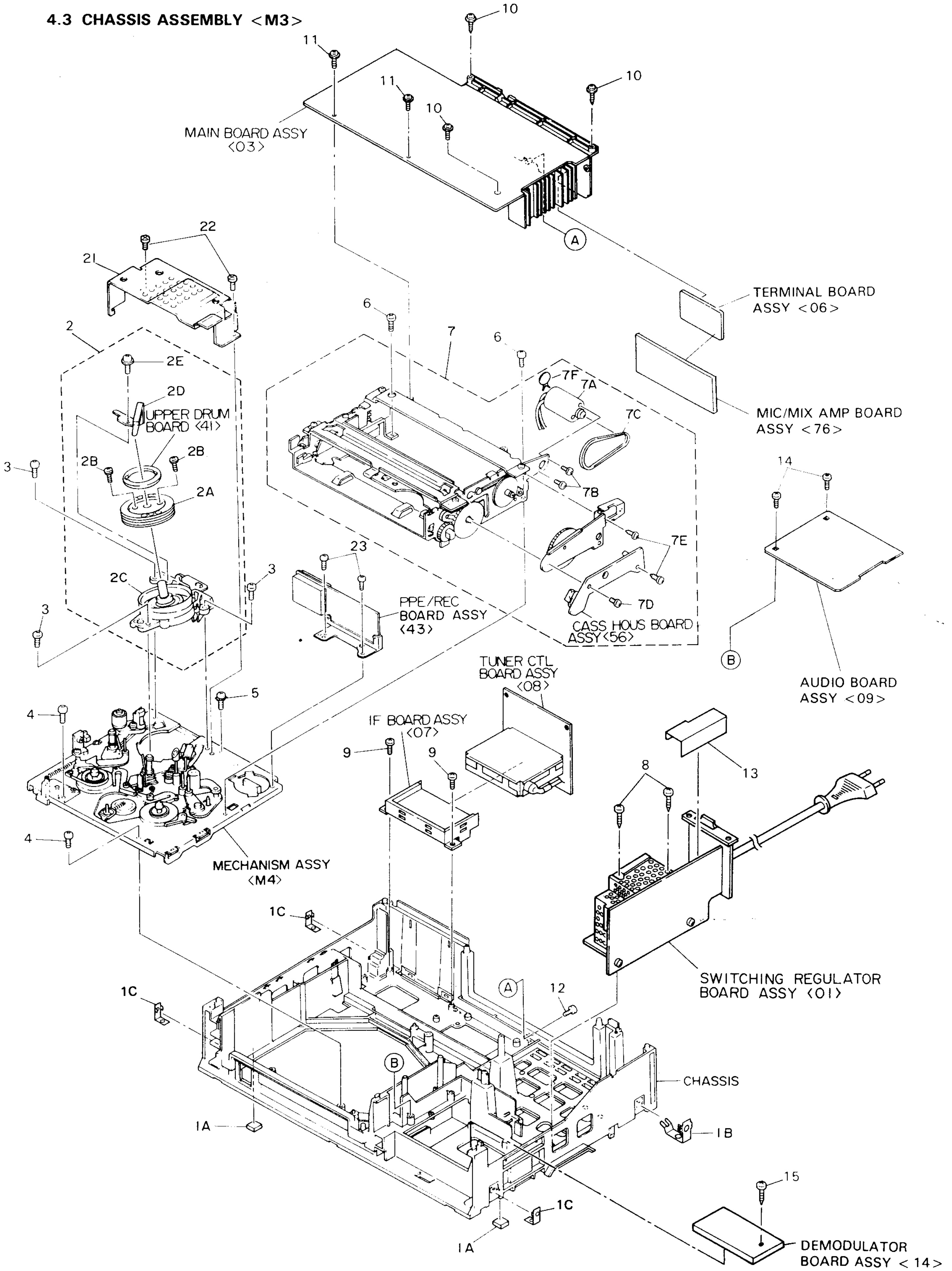
## 2. CABINET ASSEMBLY <M2>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | 1 | PQ10710A-7 | FRONT PANEL ASSY,FOR EG |
|  |  | PQ10710C-6 | FRONT PANEL ASSY,FOR E |
|  | 1A | PQ20442-10-13 | DOOR,EG |
|  |  | PQ20442-12 | DOOR,E |
|  | 1B | PQ31729-8 | BUTTON(OPE),EG |
|  |  | PQ31729-10 | BUTTON(OPE),E |
|  | 1C | PQ20493-9 | BUTTON(OPE),E |
|  |  | PQ20493-7 | BUTTON(OPE),EG |
|  | 1D | PQ32468 | BUTTON(CONT.) |
|  | 1E | PQ20443-9-9 | BUTTON(PROG.),EG |
|  |  | PQ20443-10 | BUTTON(PROG.),E |
|  | 1F | PQ31734-18 | BUTTON(TEN KEY),E |
|  |  | PQ31734-16 | BUTTON(TEN KEY),EG |
|  | 1G | PQ31734-20 | BUTTON(TEN KEY),E |
|  |  | PQ31734-17-8 | BUTTON(TEN KEY),EG |
| ⚠ | 2 | PQ10473-2-5 | TOP COVER |
|  | 3 | SDSA4014M | TAPPING SCREW,X4 |
|  | 4 | SDSF3010M | TAPPING SCREW |
| ⚠ | 5 | PQ10472-1-2 | BOTTOM COVER |
|  | 6 | SDSF3008Z | TAPPING SCREW,X5 |
|  | 7 | PQ31819-7-4 | C.HOUSING DOOR |
|  | 8 | PQ42410-1-1 | TORSION SPRING |
|  | 9 | SDSF2608Z | TAPPING SCREW,X7 |
|  | 10 | SDSF2608Z | TAPPING SCREW,X5 |
|  | 11 | PQ43081 | KNOB, PICTURE SHARPNESS |
|  | 12 | PQ43082 | KNOB, PHONE LEVEL |

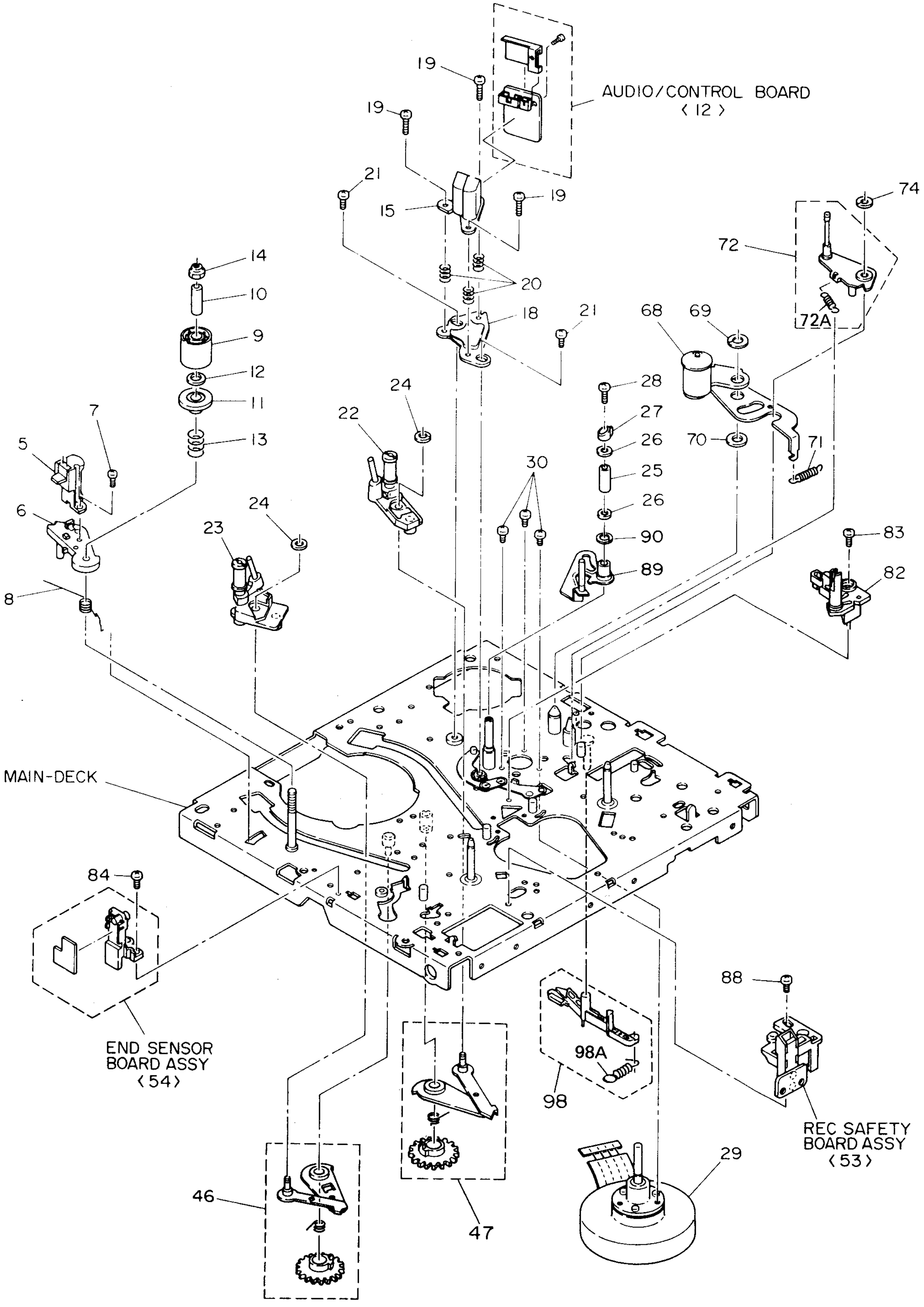
## 3. CHASSIS ASSEMBLY <M3>

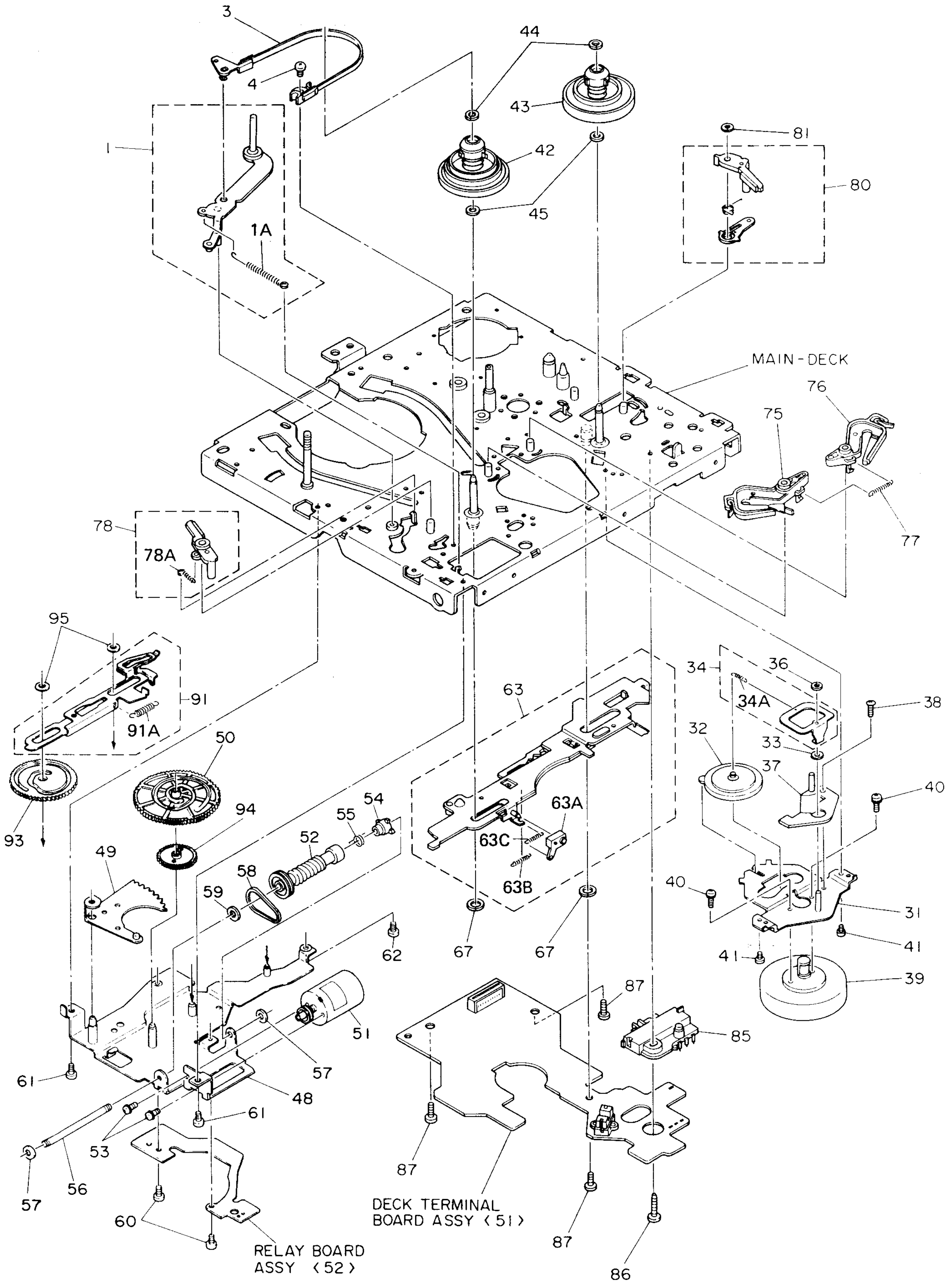
| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | 1A | PQ43013 | FOOT, X2 |
|  | 1B | PQ43023 | EARTH PLATE |
|  | 1C | PQ43011 | EARTH PLATE, X3 |
| ⚠ | 2 | PDV2143A | DRUM ASSY |
|  | 2A | PDM2112A | UPPER DRUM ASSY |
|  | 2B | PDM4165A | DRUM SCREW ASSY, X2 |
|  | 2C | PDM2101K-3 | LOWER DRUM MOTOR ASSY |
|  | 2D | PDM4015B | BRUSH ASSY |
|  | 2E | LPSP2606Z | SCREW |
|  | 3 | SDSP2608Z | SCREW, X3 DRUM |
|  | 4 | SDSA4014Z | TAPPING SCREW, X2, M. DECK |
|  | 5 | PQ41396 | SPECIAL SCREW, M. DECK |
|  | 6 | SDST2605Z | TAPPING SCREW, X2 C. HOUSING |
|  | 7 | PUS28277H | CASS.HOUSING ASSY |
| ⚠ | 7A | PQ42385A | CASSETTE MOTOR ASSY |
| ⚠ | OR | PQ42385B | CASSETTE MOTOR ASSY |
|  | 7B | SPSP2603Z | SCREW, X2 |
|  | 7C | PQM30003-19 | BELT |
|  | 7D | SPSP2604Z | SCREW |
|  | 7E | SPST2605Z | TAPPING SCREW, X2 |
|  | 7F | DV710SR223M16 | VARISTOR |
|  | 8 | SDSA4012Z | TAPPING SCREW, X2 P. TRANS |
|  | 9 | SDSF3008Z | TAPPING SCREW, X2 TUNER BOARD |
|  | 10 | GPSF2610Z | TAPPING SCREW, X3 MAIN BOARD |
|  | 11 | GPST2608Z | SCREW, X2 MAIN BOARD |
|  | 12 | SDSF3010M | TAPPING SCREW, T. BORAD |
| ⚠ | 13 | PU60728-1-1 | AC COVER |
|  | 14 | SDSF3008Z | TAPPING SCREW, X2, AUDIO BOARD |
|  | 15 | SDSF3008Z | TAPPING SCREW, DEMOD. BOARD |
|  | 21 | PQ31171-4 | DRUM SHIELD |
|  | 22 | SDST2605Z | TAPPING SCREW, X2 D. SHIELD |
|  | 23 | SDST2605Z | TAPPING SCREW, X2 P. REC BOARD |

## 4.3 CHASSIS ASSEMBLY <M3>


10
11
11
10
10
MAIN BOARD ASSY
<03>
Ⓐ
22
21
TERMINAL BOARD
ASSY <06>
6
7
6
7F
7A
7C
MIC/MIX AMP BOARD
ASSY <76>
2
2E
2D
UPPER DRUM
BOARD <41>
3
2B
2B
2A
7B
14
7E
23
3
2C
PPE/REC
BOARD ASSY
<43>
7D
CASS HOUS BOARD
ASSY<56>
3
Ⓑ
AUDIO BOARD
ASSY <09>
TUNER CTL
BOARD ASSY
<08>
5
4
IF BOARD ASSY
<07>
9
9
13
8
4
MECHANISM ASSY
<M4>
1C
SWITCHING REGULATOR
BOARD ASSY <01>
1C
Ⓐ
12
Ⓑ
CHASSIS
1A
1B
15
1C
1A
DEMODULATOR
BOARD ASSY < 14>

### 4.4 MECHANISM ASSEMBLY <M4>


AUDIO/CONTROL BOARD
<12>
19
19
19
21
15
20
18
21
14
10
9
12
11
13
7
5
6
8
22
24
24
23
30
28
27
26
25
26
90
89
68
69
70
71
72
72A
74
83
82
MAIN-DECK
84
END SENSOR
BOARD ASSY
<54>
88
REC SAFETY
BOARD ASSY
<53>
98A
98
29
46
47


3
4
1
1A
44
43
42
45
81
80
MAIN-DECK
76
75
77
78
78A
95
91
91A
93
50
94
49
52
55
54
58
59
63
63A
63C
63B
34
36
34A
38
33
32
37
40
40
31
41
41
39
62
67
67
87
85
51
57
48
61
61
53
56
57
60
87
DECK TERMINAL
BOARD ASSY <51>
87
86
RELAY BOARD
ASSY <52>

## 4. MECHANISM ASSEMBLY <M4>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | 1 | PQ41944A-7 | TENSION ARM ASSY |
| | 1A | PQ41952-3 | SPRING |
| | 3 | PQ41948A | TENSION BAND ASSY |
| | 4 | SDST2606Z | TAPPING SCREW |
| | 5 | PU57641-2 | FULL ERASE HEAD |
| | 6 | PQ31036 | FULL ERASE HEAD BASE |
| | 7 | SPSG2606Z | SCREW |
| | 8 | PQ41954-1-1 | TORSION SPRING |
| | 9 | PQ41955 | IMPEDANCE ROLLER |
| | 10 | PQ41956 | COLLAR |
| | 11 | PQ41957 | LOWER FLANGE |
| | | OR PQ42958 | LOWER FLANGE |
| | 12 | PQM30018-39 | SPACER |
| | | OR PQM30018-50 | SPACER |
| | 13 | PQM30002-124 | COMPRESSION SPRING |
| | 14 | PQ40353 | NYLON NUT |
| | 15 | PU60560 | AUDIO/CONTROL HEAD |
| | 18 | PQ42984-2 | HEAD BASE |
| | 19 | SPSP2608Z | SCREW, X3 |
| | 20 | PU30080-49 | SPRING, X3 |
| | 21 | SDSP2606Z | SCREW,X2 |
| | 22 | PU60557 | POLE BASE ASSY(TAKE-UP) |
| | | OR PU59994 | POLE BASE ASSY(TAKE-UP) |
| | 23 | PU60556 | POLE BASE ASSY(SUPPLY) |
| | | OR PU59993 | POLE BASE ASSY(SUPPLY) |
| | 24 | PQM30017-5 | SLIT WASHER,X2 |
| | 25 | PU53629-3 | TAPE GUIDE |
| | 26 | PQ40268-2 | GUIDE FLANGE, X2 |
| | 27 | PQ42999-2-1 | G.POLE CAP |
| | 28 | SDSP2006Z | SCREW |
| ⚠ | 29 | PU60201V | CAPSTAN MOTOR |
| | 30 | SPSP2605N | SCREW,X3 |
| | 31 | PQ41974A-3 | REEL MOTOR BRACKET ASSY |
| | 32 | PU58645-1-4 | IDLER ARM |
| | 33 | Q03093-834 | WASHER |
| | 34 | PQ41976A-1 | SP ARM ASSY |
| | 34A | PQ42212-1-4 | SPRING |
| | 36 | PQM30017-22 | SLIT WASHER |
| | 37 | PQ41978 | HOLDER |
| | 38 | SPST2606Z | SCREW |
| ⚠ | 39 | PU59926V | REEL MOTOR |
| | 40 | LPSP2604Z | SCREW,X2 |
| | 41 | SPST2606Z | SCREW,X2 |
| | 42 | PU59250-1-2 | REEL DISK (SUPPLY) |
| | 43 | PU58638-1-2 | REEL DISK (TAKE-UP) |
| | 44 | PQM30017-5 | SLIT WASHER,X2 |
| | 45 | Q03093-828 | WASHER,X2 |
| | 46 | PQ41979A-5 | LOADING ARM ASSY (SUPPLY) |
| | 47 | PQ41985B-3 | LOADING ARM ASSY (TAKE-UP) |
| | 48 | PQ42973A | CAM BRACKET.ASSY |
| | 49 | PQ41994A-3 | ARM GEAR ASSY |
| | 50 | PQ20577 | CONTROL CAM |
| | 51 | PQ41996B | MODE MOTOR ASSY |
| | | OR PQ41996C | MODE MOTOR ASSY |
| | 52 | PQ41998A | WORM ASSY |
| | 53 | LPSP2604Z | SCREW,X2 |
| | 54 | PQ42001 | WINDMILL |
| | 55 | PQ42002 | CLUTCH SPRING |
| | 56 | PQ42003 | WORM SHAFT |
| | 57 | PQM30017-5 | SLIT WASHER,X2 |
| | 58 | PQM30003-20 | BELT |
| | 59 | PQM30018-22 | SPACER |
| | 60 | SPST2606Z | SCREW,X2 |
| | 61 | SPST2606Z | SCREW,X2 |
| | 62 | SPSP2603Z | SCREW |
| | 63 | PQ42038C | PLATE ASSY |
| | 63A | PQ31044-1-2 | LOCK LEVER |
| | 63B | PQM30001-223 | TENSION SPRING |
| | 63C | PQM30001-211 | TENSION SPRING |
| | 67 | PQM30017-28 | SLIT WASHER, X2 |
| | 68 | PQ42006B | PINCH ROLLER ARM ASSY |
| | 69 | PQM30017-28 | SLIT WASHER |
| | 70 | Q03093-833 | WASHER |
| | 71 | PQM30001-229 | TENSION SPRING |
| | 72 | PQ42013B-4 | GUIDE ARM ASSY |
| | 72A | PQ42029 | SPRING |
| | 74 | PQM30017-6 | SLIT WASHER |
| | 75 | PQ42019B-6 | MAIN BRAKE ASSY (SUPPLY) |
| | 76 | PQ42020B | MAIN BRAKE ASSY (TAKE-UP) |
| | 77 | PQM30001-216 | TENSION SPRING |
| | 78 | PQ42021A-3 | SUB BRAKE ASSY (SUPPLY) |
| | 78A | PQ42023-1-2 | TENSION SPRING |
| | 80 | PQ42037A-2 | SUB BRAKE ASSY (TAKE-UP) |
| | 81 | PQM30017-6 | SLIT WASHER |
| | 82 | PU59925-1-1 | LED HOLDER |
| | 83 | SPST2606Z | SCREW |
| | 84 | SPST2606Z | SCREW |
| | 85 | PU60444 | SLIDE SWITCH |
| | 86 | SDSP2610Z | SCREW |
| | 87 | SDSP2606Z | SCREW,X3 |
| | 88 | SDST2606Z | TAPPING SCREW |
| | 89 | PQ42979A-2 | HALF LOADING ARM ASSY |
| | 90 | PQM30017-29 | SLIT WASHER |
| | 91 | PQ42974A | SLIDE CAM PLATE ASSEMBLY |
| | 91A | PQM30001-224 | SPRING |
| | 93 | PQ31677 | HALF LOADING CAM |
| | 94 | PQ42963 | SECOND GEAR |
| | 95 | PQM30017-24 | SLIT WASHER,X2 |
| | 98 | PQ43295A-1 | MOTOR BRAKE ASSY |
| | 98A | PQ43296 | SPRING |

# SECTION 5
# PARTS LIST

## POWER SUPPLY BOARD ASSEMBLY <01>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB20256B-01 | SWITCH REG. BOARD ASSEMBLY,E |
| | | PB20256E-01 | SWITCH REG BOARD ASSEMBLY,EG |
| | IC1 | STR10006 | IC |
| | D1 | 10E6 | DIODE |
| | D2 | 10E6 | DIODE |
| | D3 | 10E6 | DIODE |
| | D4 | 10E6 | DIODE |
| | D5 | RU1A | FR DIODE |
| | D6 | RU1A | FR DIODE |
| | D7 | AU01Z | FR DIODE |
| | D8 | AU01Z | FR DIODE |
| | D9 | AU01Z | FR DIODE |
| | D10 | 1SS133 | DIODE |
| | D20 | AU01Z | FR DIODE |
| | D21 | F6P20F | FR DIODE |
| | OR | FML-12S | FR DIODE |
| | D22 | AU01Z | FR DIODE |
| | D23 | F6P20F | FR DIODE |
| | OR | FML-12S | FR DIODE |
| | D24 | RD8.2EB2 | ZENER DIODE |
| | D25 | HZS39EB4TJ | ZENER DIODE |
| | R1 | QRZ0078-2R2 | W.W.RESISTOR |
| | R2 | QRD161J-334 | RESISTOR |
| | R3 | QRD161J-334 | RESISTOR |
| | R4 | QRG029J-104 | OMF RESISTOR |
| | R5 | QRG029J-201 | OMF RESISTOR |
| | R6 | QRZ0078-R39 | WW RESISTOR |
| | R7 | QRD161J-563 | RESISTOR |
| | R8 | QRD161J-563 | RESISTOR |
| | R9 | QVZ3507-101 | V RESISTOR |
| | R20 | QRD161J-822 | RESISTOR |
| | R21 | QRD161J-333 | RESISTOR |
| | R22 | QRZ0077-100X | FUSIBLE RESISTOR |
| ⚠ | C1 | QFZ9022-333 | MM CAPACITOR |
| ⚠ | C2 | QFZ9022-223 | MM CAPACITOR |
| ⚠ | C4 | QCZ9016-222M | CAPACITOR, EG |
| ⚠ | C5 | QCZ9016-222M | CAPACITOR |
| ⚠ | C6 | QCZ9016-222M | CAPACITOR |
| ⚠ | C7 | QCZ9016-222M | CAPACITOR |
| ⚠ | C8 | QCZ9016-222M | CAPACITOR |
| | C9 | QEZ0128-107 | E CAPACITOR |
| | C10 | QCY53AK-472 | CAPACITOR |
| | C11 | QFV41HJ-474 | M CAPACITOR |
| | C12 | QFL41HJ-222 | M CAPACITOR |
| | C13 | QEZ0108-187Z | E CAPACITOR |
| | C14 | QED61HM-105 | E CAPACITOR |
| ⚠ | C15 | QCZ9016-222M | CAPACITOR, E |
| ⚠ | C16 | QCZ9016-222M | CAPACITOR, E |
| | C17 | QCY43AK-121 | CAPACITOR |
| | C20 | QEZ0104-476Z | E CAPACITOR |
| | C21 | QETC1JM-106 | E CAPACITOR |
| | C22 | QETC1HM-106 | E CAPACITOR |
| | C23 | QEZ0125-228 | E CAPACITOR |
| | C24 | QETB1EM-228 | E CAPACITOR |
| | C25 | QEZ0104-476Z | E CAPACITOR |
| | C26 | QETC1JM-106 | E CAPACITOR |
| | C27 | QEZ0106-338 | E CAPACITOR |
| | C28 | QETB1AM-228 | E CAPACITOR |
| | C29 | QFL41HJ-102 | M CAPACITOR |
| | C30 | QFL41HJ-102 | M CAPACITOR |
| | L20 | PU48530-330K | PEAKING COIL |
| | L21 | PU59701-330 | CHOKE COIL |
| | L22 | PU48530-330K | PEAKING COIL |
| | L23 | PU59701-330 | CHOKE COIL |
| | L24 | PU48530-8R2K | CHOKE COIL |
| | L25 | PU48530-8R2K | CHOKE COIL |
| ⚠ | POC1 | QMP3980-200 | POWER CORD, E |
| ⚠ | | QMP4019-200 | POWER CORD, EG |
| ⚠ | RY1 | PU59457 | RELAY |
| ⚠ | T1 | PU60720 | SW.TRANS |
| ⚠ | BKT1 | PQ31670-4 | TRANS BRACKET |
| ⚠ | HD1 | QHS3771-108 | STRAIN RELIEF |
| ⚠ | HD2 | PU57505 | FUSE CLIP, X4 FOR F1, F2 |
| | HS1 | PQ43642 | HEAT SINK, FOR IC1 |
| | HS2 | PQ43666 | HEAT SINK, FOR D21,D23 |
| ⚠ | LF1 | PU60347 | LINE FILTER |
| | SCW1 | SDST3006Z | TAPPING SCREW,X2 |
| | SCW2 | DPSP3008Z | SCREW, FOR IC1 |
| | SCW3 | DPSP3008Z | SCREW, X2, FOR D21,D23 |
| | SLD1 | PQ32464 | SHIELD CASE (1) |
| | SLD2 | PQ32483 | SHIELD CASE(2) |
| | SLD3 | PU60766 | INSULATOR |
| ⚠ | A01 | QMC9021-001 | AC OUTLET |
| | CN1 | PU58844-7 | CAP HOUSING |
| | CN2 | PU58844-6 | CAP HOUSING |
| ⚠ | F1 | QMF51E2-1R0 | FUSE |
| ⚠ | F2 | QMF51E2-2R0 | FUSE |

## MAIN BOARD ASSEMBLY <03>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB10125C1-01 | MAIN BOARD ASSY, EG |
| | | PB10125V1-01 | MAIN BOARD ASSY, E |
| ⚠ | RF1 | PU59980M-4 | RF CONVERTER/MIX BOOSTER |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | CL1 | PU56729-2 | WIRE CLAMP, X3 |
|  | ETH1 | PQ43012 | EARTH PLATE, RF CONV. |
|  | SCW1 | SDST2605Z | TAPPING SCREW, RF CONV. |
|  | SCW2 | SDSF2608Z | TAPPING SCREW, X2 TERM. BOARD |
|  | SPC1 | PU60010 | SPACER, X2 |
| ⚠ | TML1 | PQ20438-23 | TERMINAL BOARD, EG |
| ⚠ | TML1 | PQ20438-25-15 | TERMINAL BOARD, E |
|  | WR1 | PW30401-AB20T | COAXIAL CORD |
|  | WR2 | OR PW30401-AB20S | COAXIAL CORD |
|  | J125 | P21D-04A2A2K0N | WIRE |

-LUMINANCE SECTION-

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | IC101 | PQ20166G | Y.MODULE ASS'Y, EG |
|  | IC101 | PB20166C | Y.MODULE ASSY, E |
|  | IC102 | MSM6967RS | IC |
|  | IC103 | BX6385 | IC |
|  | Q101 | 2SC1740S(QRS) | TRANSISTOR |
|  | Q102 | 2SC1740S(QRS) | TRANSISTOR |
|  | Q103 | 2SA933S(RS) | TRANSISTOR |
|  | Q104 | 2SC1740S(QRS) | TRANSISTOR |
|  | Q105 | DTC144WS | TRANSISTOR |
|  | Q106 | DTC124ES | TRANSISTOR |
|  | Q107 | 2SB810H,J | TRANSISTOR |
|  | Q108 | 2SA933S(RS) | TRANSISTOR |
|  | Q201 | DTC124ES | TRANSISTOR |
|  | Q204 | 2SC1740S(QRS) | TRANSISTOR |
|  | Q207 | DTA124ES | TRANSISTOR |
|  | Q208 | DTC124ES | TRANSISTOR |
|  | D101 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D102 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D103 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D104 | RD9.1ES-T1B2 | ZENER DIODE |
|  |  | OR UZ9.1BSB | ZENER DIODE |
|  | D105 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D106 | 1SS292 | DIODE |
|  | D107 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D108 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D109 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D110 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D111 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D112 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D121 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D124 | 1SS133 | DIODE |
|  | D125 | 1SS133 | DIODE |
|  | D203 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D204 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |
|  | D206 | 1SS133 | DIODE |
|  |  | OR MA165 | DIODE |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
|  | D207 | 1SS133 | DIODE |
|  | R101 | QRD161J-563 | RESISTOR |
|  | R102 | QRD161J-102 | RESISTOR |
|  | R103 | QRD161J-103 | RESISTOR |
|  | R104 | QRD161J-473 | RESISTOR |
|  | R106 | QRD161J-681 | RESISTOR |
|  | R107 | QRD161J-331 | RESISTOR |
|  | R108 | QRD161J-103 | RESISTOR |
|  | R109 | QRD161J-273 | RESISTOR |
|  | R110 | QRD161J-222 | RESISTOR |
|  | R111 | QRD161J-102 | RESISTOR |
|  | R112 | QVZ3518-222 | V RESISTOR |
|  |  | OR QVZ3523-222 | V RESISTOR |
|  | R113 | QRD161J-222 | RESISTOR |
|  | R114 | QRD161J-102 | RESISTOR |
| ⚠ | R115 | QRD161J-181 | RESISTOR |
|  | R116 | QRD161J-750 | RESISTOR |
|  | R117 | QRD161J-562 | RESISTOR |
|  | R120 | QRD161J-333 | RESISTOR |
|  | R121 | QRD161J-681 | RESISTOR |
|  | R122 | QRD161J-183 | RESISTOR |
|  | R123 | QRD161J-152 | RESISTOR |
|  | R124 | QRD161J-101 | RESISTOR |
|  | R127 | QVZ3518-332AZ | V RESISTOR |
|  |  | OR QVZ3523-332AZ | V RESISTOR |
|  | R128 | QRD161J-102 | RESISTOR |
|  | R129 | QRD161J-681 | RESISTOR |
|  | R130 | QRD161J-103 | RESISTOR |
|  | R131 | QRD161J-221 | RESISTOR |
|  | R132 | QRD161J-222 | RESISTOR |
|  | R133 | QRD161J-221 | RESISTOR |
|  | R134 | QRD161J-750 | RESISTOR |
|  | R135 | QRD161J-101 | RESISTOR |
|  | R141 | QRD161J-223 | RESISTOR |
|  | R142 | QRD161J-393 | RESISTOR |
|  | R143 | QRD161J-102 | RESISTOR |
|  | R145 | QRD161J-472 | RESISTOR |
|  | R146 | QRD161J-152 | RESISTOR |
|  | R201 | QRD161J-122 | RESISTOR |
|  | R202 | QRD161J-471 | RESISTOR |
|  | R203 | QRD161J-301 | RESISTOR |
|  | R204 | QVZ3518-102AZ | V RESISTOR |
|  |  | OR QVZ3523-102AZ | V RESISTOR |
|  | R206 | QRD161J-222 | RESISTOR |
|  | R207 | QRD161J-222 | RESISTOR |
|  | R210 | QRD161J-223 | RESISTOR |
|  | C101 | QCVB1CN-103 | CAPACITOR |
|  | C104 | QCVB1CN-103 | CAPACITOR |
|  | C105 | QCBB1HJ-121 | CAPACITOR |
|  | C106 | QCBB1HJ-121 | CAPACITOR |
|  | C107 | QCSB1HJ-220 | CAPACITOR |
|  | C108 | QCSB1HJ-220 | CAPACITOR |
|  | C109 | QCBB1HJ-151 | CAPACITOR |
|  | C110 | QCBB1HJ-102 | CAPACITOR |
|  | C111 | QETC1EM-335 | E CAPACITOR |
|  | C112 | QCSB1HJ-120 | CAPACITOR |
|  | C113 | QETC1AM-226 | E CAPACITOR |
|  | C114 | QEN61HM-225 | NP E CAPACITOR |
|  | C115 | QEN61AM-226 | NP E CAPACITOR |
|  | C116 | QETC1EM-475 | E CAPACITOR |
|  | C117 | QETC1HM-104 | E CAPACITOR |
|  | C118 | QCVB1CN-103 | CAPACITOR |
|  | C119 | QCVB1CN-103 | CAPACITOR |
|  | C120 | QETC1EM-475 | E CAPACITOR |
|  | C121 | QCSB1HJ-120 | CAPACITOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | C122 | QCVB1CN-103 | CAPACITOR |
| | C123 | QETC0JM-476 | E CAPACITOR |
| | C124 | QETC1AM-476 | E CAPACITOR |
| | C125 | QCVB1CN-103 | CAPACITOR |
| | C126 | QCVB1CN-103 | CAPACITOR |
| | C127 | QCVB1CN-103 | CAPACITOR |
| | C128 | QCSB1HJ-470 | CAPACITOR |
| | C129 | QETC0JM-476 | E CAPACITOR |
| | C130 | QCVB1CN-103 | CAPACITOR |
| | C131 | QETC0JM-337 | E CAPACITOR |
| | C132 | QCVB1CN-103 | CAPACITOR |
| | C133 | QCVB1CN-103 | CAPACITOR |
| | C134 | QCBB1HJ-102 | CAPACITOR |
| | C135 | QCBB1HJ-102 | CAPACITOR |
| | C136 | QEN61HM-224 | NP E CAPACITOR |
| | C137 | QETC1HM-335 | E CAPACITOR |
| | C138 | QEN61EM-335 | NP E CAPACITOR |
| | C139 | QETC0JM-477 | E CAPACITOR |
| | C140 | QETC0JM-476 | E CAPACITOR |
| | C141 | QETC1CM-476 | E CAPACITOR |
| | C142 | QETC1CM-106 | E CAPACITOR |
| | C253 | QCBB1HJ-102 | CAPACITOR |
| | L102 | PU59152-221J | PEAKING COIL |
| | L103 | PU59152-560J | PEAKING COIL |
| | L104 | PU59152-330J | PEAKING COIL |
| | L105 | PU59152-121J | PEAKING COIL |
| | L106 | PU48530-101K | PEAKING COIL |
| | L107 | PU59152-101J | PEAKING COIL |
| | L108 | PU48530-101K | PEAKING COIL |
| | L109 | PU48530-101K | PEAKING COIL |
| | L110 | PU59152-680J | PEAKING COIL |
| | L112 | PU48530-101K | PEAKING COIL |
| | L113 | PU48530-101K | PEAKING COIL |
| | L114 | PU48530-101K | PEAKING COIL |
| | L115 | PU59152-180J | PEAKING COIL |
| | L252 | PU59152-100J | PEAKING COIL |
| | EQ101 | PU60162 | EQUALIZER |
| | EQ102 | PU54838 | EQUALIZER |
| | | OR PU60714 | EQUALIZER |
| | LPF101 | PU60161 | LOW PASS FILTER |
| | | OR PU60716 | LOW PASS FILTER |
| | LPF102 | PU58021-2 | LOW PASS FILTER |
| | | OR PU58021-3 | LOW PASS FILTER |
| | SLD1 | PQ42994 | SHIELD PLATE |
| | SLD2 | PQ42995 | SHIELD CASE |
| | SLD3 | PQ42996 | SHIELD COVER |
| | TP106 | PU57545 | TEST PIN, X3 (106,121,GND) |

-COLOR SECTION-

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| ⚠ | IC301 | PB20227A | COLOR MODULE ASSY |
| | IC351 | BA7106LS | IC |
| | Q301 | 2SC1740S(RS) | TRANSISTOR |
| | Q302 | 2SC1740S(RS) | TRANSISTOR |
| | Q303 | 2SC1740S(RS) | TRANSISTOR |
| | Q305 | DTC124ES | TRANSISTOR |
| | Q306 | 2SA933S(RS) | TRANSISTOR |
| | Q307 | 2SC1740S(RS) | TRANSISTOR |
| | Q308 | 2SC1740S(RS) | TRANSISTOR |
| | Q351 | DTC124ES | TRANSISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | D302 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D303 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D351 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D352 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D353 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | R301 | QRD161J-102 | RESISTOR |
| | R302 | QRD161J-102 | RESISTOR |
| | R303 | QRD161J-473 | RESISTOR |
| | R304 | QRD161J-272 | RESISTOR |
| | R305 | QRD161J-222 | RESISTOR |
| | R306 | QRD161J-102 | RESISTOR |
| | R307 | QRD161J-102 | RESISTOR |
| | R312 | QRD161J-391 | RESISTOR |
| | R313 | QRD161J-102 | RESISTOR |
| | R314 | QRD161J-223 | RESISTOR |
| | R315 | QRD161J-102 | RESISTOR |
| | R316 | QRD161J-183 | RESISTOR |
| | R317 | QRD161J-102 | RESISTOR |
| | R318 | QRD161J-102 | RESISTOR |
| | R319 | QRD161J-331 | RESISTOR |
| | R320 | QRD161J-222 | RESISTOR |
| | R321 | QVZ3518-681AZ | V RESISTOR |
| | | OR QVZ3523-681AZ | V RESISTOR |
| | R322 | QRD161J-153 | RESISTOR |
| | R323 | QRD161J-103 | RESISTOR |
| | R324 | QRD161J-222 | RESISTOR |
| | R325 | QRD161J-391 | RESISTOR |
| | R326 | QRD161J-471 | RESISTOR |
| | R327 | QRD161J-821 | RESISTOR |
| | R331 | QRD161J-333 | RESISTOR |
| | R332 | QRD161J-333 | RESISTOR |
| | R333 | QRD161J-152 | RESISTOR |
| | R334 | QRD161J-102 | RESISTOR |
| | R335 | QRD161J-393 | RESISTOR |
| | R336 | QRD161J-332 | RESISTOR |
| | R351 | QRD161J-914 | RESISTOR |
| | R352 | QRD161J-104 | RESISTOR |
| | R353 | QRD161J-103 | RESISTOR |
| | R354 | QRD161J-273 | RESISTOR |
| | R355 | QRD161J-223 | RESISTOR |
| | R356 | QRD161J-333 | RESISTOR |
| | C301 | QCVB1CN-103 | CAPACITOR |
| | C302 | QCBB1HJ-820 | CAPACITOR |
| | C303 | QCVB1CN-103 | CAPACITOR |
| | C305 | QCC31CJ-473 | CAPACITOR |
| | C306 | QCSB1HJ-470 | CAPACITOR |
| | C311 | QFN31HJ-224 | M CAPACITOR |
| | C312 | QFN31HJ-563 | M CAPACITOR |
| | C313 | QETC0JM-337 | E CAPACITOR |
| | C314 | QETC1HM-474 | E CAPACITOR |
| | C315 | QETC1HM-104 | E CAPACITOR |
| | C316 | QCVB1CN-103 | CAPACITOR |
| | C317 | QETC1HM-474 | E CAPACITOR |
| | C318 | QETC1CM-106 | E CAPACITOR |
| | C319 | QETC0JM-107 | E CAPACITOR |
| | C320 | QCVB1CN-103 | CAPACITOR |
| | C321 | QCVB1CN-103 | CAPACITOR |
| | C323 | QCVB1CN-103 | CAPACITOR |
| | C324 | QETC1HM-475 | E CAPACITOR |
| | C325 | QCVB1CN-103 | CAPACITOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | C326 | QFN31HJ-682 | M CAPACITOR |
| | C332 | QCC31CJ-223 | CAPACITOR |
| | C351 | QETC1CM-106 | E CAPACITOR |
| | C352 | QETC1HM-335 | E CAPACITOR |
| | C353 | QCBB1HJ-471 | CAPACITOR |
| | C354 | QCVB1CN-103 | CAPACITOR |
| | C355 | QCVB1CN-103 | CAPACITOR |
| | C356 | QCVB1CN-103 | CAPACITOR |
| | C357 | QCVB1CN-103 | CAPACITOR |
| | C358 | QCVB1CN-103 | CAPACITOR |
| | C359 | QETC0JM-476 | E CAPACITOR |
| | C360 | QCSB1HJ-200 | CAPACITOR |
| | C361 | QCSB1HK-4R7 | CAPACITOR |
| | C362 | QCXB1CN-472 | CAPACITOR |
| | C363 | QCSB1HJ-270 | CAPACITOR |
| | C364 | QFN31HJ-471 | M CAPACITOR |
| | L301 | PU54710-222 | PEAKING COIL |
| | L302 | PU48530-271J | PEAKING COIL |
| | L303 | PU59153-822J | PEAKING COIL |
| | L304 | PU48530-181J | INDUCTOR |
| | L305 | PU59152-150J | PEAKING COIL |
| | L306 | PU48530-821J | PEAKING COIL |
| | L351 | PU48530-101K | PEAKING COIL |
| | L352 | PU59152-330J | PEAKING COIL |
| | L353 | PU60655 | COIL |
| | EQ301 | PU53501-14 | EQUALIZER |
| | LPF301 | PU58022 | LOW PASS FILTER |
| | BPF301 | PU57072 | BAND PASS FILTER |
| | BPF302 | PU60654 | BAND PASS FILTER |
| | CF301 | PU57073 | CERAMIC FILTER |
| | DL301 | PU60340 | COMB FILTER |
| | OR | PU60490 | COMB FILTER |
| | OR | PU60222 | 2H DELAY LINE |
| | OR | PU58971-3 | 2H DELAY LINE |
| ⚠ | X301 | PU60653 | CRYSTAL RESONATOR |
| | TP205 | PU57545 | TEST PIN, X3 (205,304,351) |

-SERVO SECTION-

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | IC441 | HD49722NT | IC |
| | IC471 | BU2767S | IC |
| | IC472 | BU4069UB | IC |
| | Q401 | DTC144ES | TRANSISTOR |
| | OR | 2SC3399 | TRANSISTOR |
| | OR | UN4213 | TRANSISTOR |
| | Q405 | DTA124ES | TRANSISTOR |
| | OR | UN4112 | TRANSISTOR |
| | OR | 2SA1346 | TRANSISTOR |
| | Q406 | DTA124ES | TRANSISTOR |
| | OR | 2SA1346 | TRANSISTOR |
| | OR | UN4112 | TRANSISTOR |
| | Q407 | DTC144ES | TRANSISTOR |
| | OR | 2SC3399 | TRANSISTOR |
| | OR | UN4213 | TRANSISTOR |
| | D401 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D402 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D407 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D408 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D411 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D412 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D413 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D414 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D418 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D419 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D422 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D441 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D442 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D443 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D473 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | R401 | QRD161J-102 | RESISTOR |
| | R405 | QRD161J-273 | RESISTOR |
| | R406 | QRD161J-222 | RESISTOR |
| | R407 | QRD161J-332 | RESISTOR |
| | R410 | QRD161J-223 | RESISTOR |
| | R413 | QRD161J-394 | RESISTOR |
| | R414 | QVZ3518-474AZ | V RESISTOR, SP X2 |
| | OR | QVZ3523-474AZ | V RESISTOR, SP X2 |
| | R415 | QRD161J-104 | RESISTOR |
| | R416 | QVZ3521-105 | V RESISTOR |
| | R417 | QRD161J-102 | RESISTOR |
| | R418 | QRD161J-683 | RESISTOR |
| | R419 | QRD161J-274 | RESISTOR |
| | R420 | QRD161J-333 | RESISTOR |
| | R421 | QRD161J-100 | RESISTOR |
| | R422 | QRD161J-103 | RESISTOR |
| | R423 | QRD161J-183 | RESISTOR |
| | R425 | QRD161J-103 | RESISTOR |
| | R427 | QRD161J-103 | RESISTOR |
| | R432 | QRD161J-682 | RESISTOR |
| | R441 | QRD161J-682 | RESISTOR |
| | R442 | QRD161J-102 | RESISTOR |
| | R443 | QRD161J-155 | RESISTOR |
| | R444 | QRD161J-105 | RESISTOR |
| | R445 | QRD161J-102 | RESISTOR |
| | R446 | QRD161J-332 | RESISTOR |
| | R447 | QRD161J-102 | RESISTOR |
| | R448 | QRD161J-475 | RESISTOR |
| | R449 | QRD161J-333 | RESISTOR |
| | R450 | QRD161J-392 | RESISTOR |
| | R451 | QRD161J-153 | RESISTOR |
| | R452 | QRD161J-182 | RESISTOR |
| | R453 | QRD161J-105 | RESISTOR |
| | R454 | QRD161J-273 | RESISTOR |
| | R455 | QRD161J-395 | RESISTOR |
| | R456 | QRD161J-105 | RESISTOR |
| | R457 | QRD161J-273 | RESISTOR |
| | R458 | QRD161J-274 | RESISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | R459 | QRD161J-393 | RESISTOR |
| | R460 | QRD161J-475 | RESISTOR |
| | R461 | QRD161J-334 | RESISTOR |
| | R462 | QRD161J-222 | RESISTOR |
| | R463 | QRD161J-102 | RESISTOR |
| | R464 | QRD161J-104 | RESISTOR |
| | R465 | QVZ3518-684AZ | V RESISTOR, SP SW P |
| | OR | QVZ3518-684 | V RESISTOR, SP SW P |
| | R466 | QRD161J-154 | RESISTOR |
| | R467 | QRD161J-103 | RESISTOR |
| | R468 | QRD161J-102 | RESISTOR |
| | R469 | QRD161J-102 | RESISTOR |
| | R470 | QRD161J-154 | RESISTOR |
| | R471 | QRD161J-102 | RESISTOR |
| | R472 | QRD161J-104 | RESISTOR |
| | R473 | QRD161J-153 | RESISTOR |
| | R474 | QRD161J-822 | RESISTOR |
| | R475 | QRD161J-334 | RESISTOR |
| | R476 | QRD161J-684 | RESISTOR |
| | R477 | QRD161J-103 | RESISTOR |
| | R478 | QVZ3518-105AZ | V RESISTOR , SP SLOW |
| | OR | QVZ3518-105 | V RESISTOR , SP SLOW |
| | R479 | QRD161J-154 | RESISTOR |
| | R480 | QRD161J-274 | RESISTOR |
| | R481 | QRD161J-104 | RESISTOR |
| | R482 | QRD161J-472 | RESISTOR |
| | R483 | QRD161J-103 | RESISTOR |
| | C401 | QCC11CK-473 | CAPACITOR |
| | C402 | QCBB1HJ-102 | CAPACITOR |
| | C406 | QCC11CK-102 | CAPACITOR |
| | C407 | QFL41HJ-102 | M CAPACITOR |
| | C408 | QFV71HJ-124 | M CAPACITOR |
| | C409 | QFV71HJ-224 | M CAPACITOR |
| | C411 | QFV71HJ-274 | M CAPACITOR |
| | C441 | QCC11CK-102 | CAPACITOR |
| | C442 | QETC1AM-226 | E CAPACITOR |
| | C443 | QETC1AM-226 | E CAPACITOR |
| | C444 | QCSB1HJ-150 | CAPACITOR |
| | C445 | QETC1HM-105 | E CAPACITOR |
| | C446 | QCC11CK-153 | CAPACITOR |
| | C448 | QCBB1HJ-561 | CAPACITOR |
| | C449 | QCC11CK-102 | CAPACITOR |
| | C450 | QEK61HM-105 | E CAPACITOR |
| | C451 | QEK61AM-226 | E CAPACITOR |
| | C452 | QCBB1HJ-101 | CAPACITOR |
| | C453 | QFV71HJ-564 | M CAPACITOR |
| | C454 | QFV71HJ-153 | M CAPACITOR |
| | C455 | QETC1EM-475 | E CAPACITOR |
| | C456 | QETB1EM-475 | E CAPACITOR |
| | C457 | QETC1CM-106 | E CAPACITOR |
| | C458 | QETC1CM-106 | E CAPACITOR |
| | C459 | QCC11CK-333 | CAPACITOR |
| | C460 | QFV71HJ-334 | M CAPACITOR |
| | C461 | QCBB1HJ-471 | CAPACITOR |
| | C462 | QFL41HJ-682 | M CAPACITOR |
| | C463 | QCBB1HJ-102 | CAPACITOR |
| | C464 | QFV71HJ-474 | M CAPACITOR |
| | C471 | QCC11CK-102 | CAPACITOR |
| | C472 | QFV71HJ-393 | M CAPACITOR |
| | C473 | QFV71HJ-393 | M CAPACITOR |
| | C474 | QFV71HJ-104 | M CAPACITOR |
| | C475 | QFV71HJ-124 | M CAPACITOR |
| | C476 | QFV71HJ-393 | M CAPACITOR |
| | C477 | QCBB1HJ-121 | CAPACITOR |
| | C478 | QEK61AM-226 | E CAPACITOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | C479 | QCBB1HJ-101 | CAPACITOR |
| | C480 | QCBB1HJ-101 | CAPACITOR |
| | C481 | QCBB1HJ-561 | CAPACITOR |
| | TP401 | PU57545 | TEST PIN, X4 (401,411,471,GND) |
| | CN401 | PU58844-4 | CAP HOUSING |

-MECHACON SECTION-

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | IC601 | M50965-367SP | IC |
| | OR | M50965E-342SP | IC |
| | IC602 | TA8405S | IC |
| | IC603 | M54647L | IC |
| | IC604 | BA6222 | IC |
| | Q601 | 2SC1740S(RS) | TRANSISTOR |
| | D601 | HZS4.3EB2 | ZENER DIODE |
| | D602 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D603 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D604 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D606 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D608 | HZS7.5EB2 | ZENER DIODE |
| | D610 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D611 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D612 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | R602 | QRD161J-332 | RESISTOR |
| | R603 | QRD161J-122 | RESISTOR |
| | R604 | QRD161J-823 | RESISTOR |
| | R605 | QRD161J-102 | RESISTOR |
| | R606 | QRD161J-102 | RESISTOR |
| | R607 | QRD161J-103 | RESISTOR |
| | R608 | QRD161J-103 | RESISTOR |
| | R611 | QRD161J-102 | RESISTOR |
| | R612 | QRD161J-472 | RESISTOR |
| | R613 | QRD161J-105 | RESISTOR |
| | R614 | QRD161J-472 | RESISTOR |
| | R615 | QRD161J-472 | RESISTOR |
| | R616 | QRD161J-472 | RESISTOR |
| | R617 | QRD161J-472 | RESISTOR |
| | R618 | QRD161J-472 | RESISTOR |
| | R619 | QRD161J-472 | RESISTOR |
| | R620 | QRD161J-472 | RESISTOR |
| | R621 | QRD161J-472 | RESISTOR |
| | R622 | QRD161J-333 | RESISTOR |
| | R623 | QRD161J-124 | RESISTOR |
| | R624 | QRD161J-124 | RESISTOR |
| | R625 | QRD161J-472 | RESISTOR |
| | R626 | QRD161J-472 | RESISTOR |
| | R627 | QRD161J-472 | RESISTOR |
| | R628 | QRD161J-472 | RESISTOR |
| | R629 | QRD161J-472 | RESISTOR |
| | R630 | QRD161J-821 | RESISTOR |
| | R631 | QRD161J-331 | RESISTOR |
| | R632 | QRD161J-822 | RESISTOR |
| | R633 | QRD161J-103 | RESISTOR |
| | R634 | QRD161J-103 | RESISTOR |
| | R635 | QRD161J-333 | RESISTOR |
| | R637 | QRD161J-152 | RESISTOR |
| | R638 | QRD161J-471 | RESISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | R642 | QRD181J-103 | RESISTOR |
| | R643 | QRD181J-103 | RESISTOR |
| | R644 | QRD181J-103 | RESISTOR |
| | RA601 | QRB047J-103 | RESISTOR ARRAY |
| | OR | QRB049J-103 | RESISTOR ARRAY |
| | RA602 | QRB047J-472 | NETWORK RESISTOR |
| | OR | QRB049J-472 | RESISTOR ARRAY |
| | C601 | QCFB1EZ-223 | CAPACITOR |
| | C602 | QETC1EM-335 | E CAPACITOR |
| | C603 | QCFB1EZ-223 | CAPACITOR |
| | C604 | QETB1HM-105 | E CAPACITOR |
| | C605 | QETC1EM-106 | E CAPACITOR |
| | C606 | QETC1EM-106 | E CAPACITOR |
| | C607 | QETC1EM-475 | E CAPACITOR |
| | C608 | QCF11HP-223 | CAPACITOR |
| | L601 | PU53223-R22G | PEAKING COIL |
| | CF601 | PU60030 | RESONATOR |
| | OR | PU60125 | RESONATOR |
| | SCW1 | SBSE3006Z | TAPPING SCREW, X2 |
| | J611 | P211-06A2A2K0K0 | WIRE |
| | J612 | P210-05A2A2K0K0 | WIRE |
| | CN601 | PU59934-15 | WIRE HOLDER |
| | CN603 | PU59555-12 | CAP HOUSING |
| | CN604 | PU59555-10 | CAP HOUSING |
| | CN606 | PU58844-4 | CAP HOUSING |
| | CN607 | PU59555-9 | CAP HOUSING |
| ⚠ | CP602 | ICP-F20 | CIRCUIT PROTECTOR |

-REGULATOR SECTION-

| | | | |
|---|---|---|---|
| | IC801 | STK5490 | IC |
| | IC802 | MC7805ACT | IC |
| | Q801 | DTB114ES | TRANSISTOR |
| | D802 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | D803 | RD6.2ES-T1B2 | ZENER DIODE |
| | D804 | MA165 | DIODE |
| | OR | 1SS133 | DIODE |
| | R801 | QRD161J-272 | RESISTOR |
| | R802 | QRD161J-272 | RESISTOR |
| | R803 | QRD161J-223 | RESISTOR |
| | C801 | QETC1CM-107 | E CAPACITOR |
| | C802 | QETC1CM-107 | E CAPACITOR |
| | C803 | QETB1CM-107 | E CAPACITOR |
| | C804 | QETC0JM-107 | E CAPACITOR |
| | C805 | QETC1EM-106 | E CAPACITOR |
| | C807 | QETC0JM-107 | E CAPACITOR |
| ⚠ | HS1 | PQ32206 | HEAT SINK, FOR IC801 |
| ⚠ | HS2 | PU60786 | HEAT SINK, FOR IC802 |
| | SCW1 | SDSB3014Z | TH.TAP SCREW, X2 |
| | SCW2 | SDSB3010Z | SCREW, X2 |
| | SCW3 | SDSB3008Z | TAPPING SCREW, FOR IC802 |
| | CP802 | ICP-F25 | CIRCUIT PROTECTOR |
| | CP803 | ICP-F38 | CIRCUIT PROTECTOR |
| | CP804 | ICP-F25 | CIRCUIT PROTECTOR |

-MAIN SUB SECTION-

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB30079A-01 | MAIN SUB BOARD ASSEMBLY |
| | Q271 | 2SC1740S(QRS) | TRANSISTOR |
| | Q272 | DTC144ES | TRANSISTOR |
| | Q273 | DTC144ES | TRANSISTOR |
| | D271 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D272 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | R271 | QRD161J-394 | RESISTOR |
| | R272 | QRD161J-104 | RESISTOR |
| | R273 | QRD161J-103 | RESISTOR |
| | R274 | QRD161J-562 | RESISTOR |
| | R275 | QRD161J-223 | RESISTOR |
| | R276 | QRD161J-182 | RESISTOR |
| | R277 | QRD161J-682 | RESISTOR |
| | C271 | QCVB1CN-103 | CAPACITOR |
| | C272 | QEN60JM-336 | NP E CAPACITOR |
| | SPC1 | PQM30029-107 | SPACER |

-R.PAUSE BOARD SECTION-

| | | | |
|---|---|---|---|
| | JC1 | PU60659 | MINI JACK |

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* TERMINAL BOARD ASSEMBLY <06> *
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| | | | |
|---|---|---|---|
| | PWBA | PB30080A | TERMINAL BOARD ASSEMBLY |
| | IC1 | LA7222 | IC |
| | IC2 | M5218P | IC |
| | R1 | QRD161J-471 | RESISTOR |
| | R2 | QRD161J-471 | RESISTOR |
| | R3 | QRD161J-103 | RESISTOR |
| | R4 | QRD161J-103 | RESISTOR |
| | R5 | QRD161J-273 | RESISTOR |
| | R6 | QRD161J-273 | RESISTOR |
| | R7 | QRD161J-563 | RESISTOR |
| | R8 | QRD161J-563 | RESISTOR |
| | R9 | QRD161J-563 | RESISTOR |
| | R10 | QRD161J-563 | RESISTOR |
| | R11 | QRD161J-471 | RESISTOR |
| | R12 | QRD161J-471 | RESISTOR |
| | R13 | QRD161J-223 | RESISTOR |
| | C1 | QEK61HM-475 | E CAPACITOR |
| | C2 | QEK61HM-475 | E CAPACITOR |
| | C3 | QEK61CM-106 | E CAPACITOR |
| | C4 | QEK61CM-106 | E CAPACITOR |
| | C6 | QEP61EM-475 | NP E CAPACITOR |
| | C7 | QEP61EM-475 | NP E CAPACITOR |
| | TML1 | PU60677 | CONN.BOARD ASSY |

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* IF BOARD ASSEMBLY <07> *
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|---|---|---|---|
| | PWBA | PB10047C | IF BOARD ASSEMBLY |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | IC1 | M51365SP | IC |
| | Q 1 | 2SC3354 | TRANSISTOR |
| | Q 2 | 2SC3354 | TRANSISTOR |
| | Q 3 | 2SC1317(RS) | TRANSISTOR |
| | Q 4 | 2SC1740(RS) | TRANSISTOR |
| | | OR 2SC3311A(RS) | TRANSISTOR |
| | | OR 2SC536SPA(FG) | TRANSISTOR |
| | Q 5 | 2SC1740(RS) | TRANSISTOR |
| | | OR 2SC3311A(RS) | TRANSISTOR |
| | | OR 2SC536SPA(FG) | TRANSISTOR |
| | Q 6 | 2SA933S(RS) | TRANSISTOR |
| | | OR 2SA1309AR,S | TRANSISTOR |
| | Q 7 | 2SC1740(RS) | TRANSISTOR |
| | | OR 2SC3311A(RS) | TRANSISTOR |
| | | OR 2SC536SPA(FG) | TRANSISTOR |
| | Q10 | 2SC3354 | TRANSISTOR |
| | Q11 | 2SC1740(RS) | TRANSISTOR |
| | | OR 2SC3311A(RS) | TRANSISTOR |
| | | OR 2SC536SPA(FG) | TRANSISTOR |
| | Q12 | DTC144ES | TRANSISTOR |
| | | OR UN4213 | TRANSISTOR |
| | | OR 2SC3399 | TRANSISTOR |
| | Q13 | DTC144ES | TRANSISTOR |
| | | OR UN4213 | TRANSISTOR |
| | | OR 2SC3399 | TRANSISTOR |
| | D1 | MTZ10B | ZENER DIODE |
| | D6 | 1SS133 | DIODE |
| | D7 | 1SS133 | DIODE |
| | D8 | 1SS133 | DIODE |
| | R 1 | NRD718J-750NBU | RESISTOR |
| | R 4 | NRD718J-332NBU | RESISTOR |
| | R 6 | NRD718J-182NBU | RESISTOR |
| | R7 | NRD718J-331NBU | RESISTOR |
| | R 8 | NRD718J-681NBU | RESISTOR |
| | R10 | NRD718J-271NBU | RESISTOR |
| | R11 | NRD718J-180NBU | RESISTOR |
| | R15 | NRD718J-271NBU | RESISTOR |
| | R17 | NRD718J-562NBU | RESISTOR |
| | R18 | NRD718J-332NBU | RESISTOR |
| | R19 | NRD718J-272NBU | RESISTOR |
| | R20 | NRD718J-222NBU | RESISTOR |
| | R21 | QVZ3518-472 | V RESISTOR |
| | | OR QVZ3523-472 | V RESISTOR |
| | R22 | NRD718J-824NBU | RESISTOR |
| | R24 | NRD718J-821NBU | RESISTOR |
| | R31 | NRD718J-222NBU | RESISTOR |
| | R32 | NRD718J-102NBU | RESISTOR |
| | R33 | NRD718J-223NBU | RESISTOR |
| | R34 | NRD718J-470NBU | RESISTOR |
| | R35 | NRD718J-561NBU | RESISTOR |
| | R36 | NRD718J-561NBU | RESISTOR |
| | R37 | NRD718J-271NBU | RESISTOR |
| | R38 | NRD718J-182NBU | RESISTOR |
| | R39 | NRD718J-272NBU | RESISTOR |
| | R40 | QVZ3518-103 | V RESISTOR |
| | | OR QVZ3523-103 | V RESISTOR |
| | R41 | NRD718J-222NBU | RESISTOR |
| | R45 | NRD718J-471NBU | RESISTOR |
| | R46 | NRD718J-104NBU | RESISTOR |
| | R47 | NRD718J-153NBU | RESISTOR |
| | R48 | NRD718J-392NBU | RESISTOR |
| | R49 | NRD718J-103NBU | RESISTOR |
| | R50 | NRD718J-471NBU | RESISTOR |
| | R51 | NRD718J-223NBU | RESISTOR |
| | R52 | NRD718J-223NBU | RESISTOR |
| | R53 | NRD718J-103NBU | RESISTOR |
| | R54 | NRD718J-682NBU | RESISTOR |
| | R57 | NRD718J-153NBU | RESISTOR |
| | R62 | NRD718J-392NBU | RESISTOR |
| | R63 | NRD718J-470NBU | RESISTOR |
| | R64 | NRD718J-182NBU | RESISTOR |
| | R65 | NRD718J-271NBU | RESISTOR |
| | R71 | NRD718J-681NBU | RESISTOR |
| | R72 | NRD718J-120NBU | RESISTOR |
| | R73 | NRD718J-331NBU | RESISTOR |
| | R82 | NRD718J-680NBU | RESISTOR |
| | R83 | NRD718J-222NBU | RESISTOR |
| | R84 | NRD718J-123NBU | RESISTOR |
| | R85 | NRD718J-123NBU | RESISTOR |
| | R86 | NRD718J-331NBU | RESISTOR |
| | R100 | QRD162J-0R0 | RESISTOR |
| | R101 | QRD161J-182 | RESISTOR |
| | R102 | QRD161J-222 | RESISTOR |
| | C 5 | NCB71HK-102NBR | CAPACITOR |
| | C 6 | NCX71CM-222NBR | CAPACITOR |
| | C 7 | NCB71HK-102NBR | CAPACITOR |
| | C 8 | NCB71HK-102NBR | CAPACITOR |
| | C10 | QETC1CM-336 | E CAPACITOR |
| | C11 | NCY71CM-103NBR | CAPACITOR |
| | C13 | NCX71CM-222NBR | CAPACITOR |
| | C14 | PU57601-474MEZ | E CAPACITOR |
| | C15 | QETC1CM-336 | E CAPACITOR |
| | C16 | NCX71CM-222NBR | CAPACITOR |
| | C17 | NCF71EZ-223NBR | CAPACITOR |
| | C19 | NCY71CM-103NBR | CAPACITOR |
| | C20 | NCY71CM-103NBR | CAPACITOR |
| | C21 | NCB71HK-101NBR | CAPACITOR |
| | C24 | QETC1HM-105 | E CAPACITOR |
| | C25 | NCX71CM-222NBR | CAPACITOR |
| | C26 | QFN31HK-222 | M CAPACITOR |
| | C27 | QETC1HM-474 | E CAPACITOR |
| | C29 | NCS71HJ-470NBR | CAPACITOR |
| | C31 | QETC1HM-335 | E CAPACITOR |
| | C32 | NCF71EZ-223NBR | CAPACITOR |
| | C33 | QETC1HM-474 | E CAPACITOR |
| | C41 | NCB71HK-102NBR | CAPACITOR |
| | C43 | NCX71CM-222NBR | CAPACITOR |
| | C44 | NCB71HK-102NBR | CAPACITOR |
| | C45 | NCB71HK-102NBR | CAPACITOR |
| | C46 | NCB71HK-102NBR | CAPACITOR |
| | C50 | QETC1CM-336 | E CAPACITOR |
| | C56 | QETC1CM-336 | E CAPACITOR |
| | C57 | QEN61CM-336 | NP E CAPACITOR |
| | C58 | NCS71HJ-100NBR | CAPACITOR |
| | C60 | NCB71HK-102NBR | CAPACITOR |
| | L 2 | PU60025-1R0 | PEAKING COIL |
| | L 3 | PU60025-1R2 | PEAKING COIL |
| | L 4 | PU59152-150J | PEAKING COIL |
| | L 5 | PU59152-220J | PEAKING COIL |
| | L 6 | PU59152-6R8K | PEAKING COIL |
| | L 7 | PU59152-R22K | PEAKING COIL |
| | CF1 | PU49295-2 | N FILTER |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | CF3 | PU32990-2 | CERAMIC FILTER |
| | CF4 | PU49295 | CERAMIC FILTER |
| | SAW1 | PU35557-7 | SAW FILTER |
| | SAW2 | PU60765 | SAW FILTER |
| | T 2 | PU60497 | IF.TRANSFORMER, VCO |
| | T 4 | PU59488 | COIL |
| | T 5 | PU60046 | IF.TRANSFORMER, SYNC |
| | T 8 | PU60259 | COIL |
| | TML1 | PU59935-16 | TERMINAL (JP1) |

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## TUNER CONTROL BOARD ASSEMBLY <08>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB20102C | TUNER CONTROL BOARD ASSEMBLY |
| ⚠ | TNR1 | PU36155-1-4 | UHF/VHF TUNER |
| | IC 1 | M50445-398SP | IC |
| | IC 2 | MSM16811RS | IC |
| | OR | CAT93C46P | IC |
| | Q 1 | 2SC1740S(RS) | TRANSISTOR |
| | OR | 2SC3311A(RS) | TRANSISTOR |
| | OR | 2SC536SPA(FG) | TRANSISTOR |
| | Q 2 | 2SK381(C) | FE TRANSISTOR |
| | Q 3 | UN4319VI | TRANSISTOR |
| | Q 4 | UN4319VI | TRANSISTOR |
| | Q 5 | UN4319VI | TRANSISTOR |
| | Q 6 | UN4319VI | TRANSISTOR |
| | Q 7 | DTA124ES | TRANSISTOR |
| | Q 8 | 2SB810H,J | TRANSISTOR |
| | Q10 | 2SD1863(QR) | TRANSISTOR |
| | OR | 2SC3243D,E | TRANSISTOR |
| | Q11 | 2SC3354 | TRANSISTOR |
| | D 1 | 1SS133 | DIODE |
| | D 2 | E-452-2 | DIODE |
| | D 3 | HZ30-2 | ZENER DIODE |
| | D 4 | RD5.6ES-T1B3 | ZENER DIODE |
| | OR | MTZ5.6CT-77 | ZENER DIODE |
| | R 3 | QRD161J-472 | RESISTOR |
| | R 4 | QRD161J-472 | RESISTOR |
| | R 5 | QRD161J-104 | RESISTOR |
| | R 6 | QRD161J-472 | RESISTOR |
| | R 7 | QRD161J-103 | RESISTOR |
| | R 8 | QRD161J-472 | RESISTOR |
| | R11 | QRD161J-103 | RESISTOR |
| | R12 | QRD161J-121 | RESISTOR |
| | R13 | QRD161J-152 | RESISTOR |
| | R14 | QRD161J-562 | RESISTOR |
| | R15 | QRD161J-472 | RESISTOR |
| | R16 | QRD161J-472 | RESISTOR |
| | R17 | QRD161J-153 | RESISTOR |
| | R18 | QRD161J-101 | RESISTOR |
| | R19 | QRD161J-103 | RESISTOR |
| | R20 | QRD161J-104 | RESISTOR |
| | R22 | QRD161J-104 | RESISTOR |
| | R26 | QRD161J-104 | RESISTOR |
| | R32 | QRD161J-222 | RESISTOR |
| | R33 | QRD161J-222 | RESISTOR |
| | R34 | QRD161J-103 | RESISTOR |
| | R35 | QRD161J-102 | RESISTOR |
| | R36 | QRD161J-103 | RESISTOR |
| | R40 | QRD161J-102 | RESISTOR |
| | R41 | QRD161J-331 | RESISTOR |
| | R45 | QRD161J-103 | RESISTOR |
| | R46 | QRD161J-103 | RESISTOR |
| | R47 | QRD161J-103 | RESISTOR |
| | R48 | QRD161J-103 | RESISTOR |
| | RA 1 | QRB047J-104 | NETWORK RESISTOR |
| | C 2 | QCBB1HK-102 | CAPACITOR |
| | C 3 | QETC1CM-107 | E CAPACITOR |
| | C 4 | QETC1CM-106 | E CAPACITOR |
| | C 5 | QETC1CM-106 | E CAPACITOR |
| | C 6 | QEK61HM-225 | E CAPACITOR |
| | C 7 | QETC1CM-106 | E CAPACITOR |
| | C 8 | QCBB1HK-102 | CAPACITOR |
| | C 9 | QETC1CM-106 | E CAPACITOR |
| | C13 | QFN31HJ-153 | M CAPACITOR |
| | C14 | QFV81HJ-474 | M CAPACITOR |
| | OR | QFZ9011-474 | MM CAPACITOR |
| | C15 | QETC1HM-106 | E CAPACITOR |
| | C16 | QCBB1HK-102 | CAPACITOR |
| | C17 | QCVB1CM-103 | CAPACITOR |
| | C18 | QCT25CH-220 | CAPACITOR |
| | C19 | QCT25CH-270 | CAPACITOR |
| | C20 | PU57601-335MCZ | E CAPACITOR |
| | C23 | QETC1CM-106 | E CAPACITOR |
| | C24 | QETC1AM-107 | E CAPACITOR |
| | C25 | QETC1AM-336 | E CAPACITOR |
| | C31 | QCVB1CM-103 | CAPACITOR |
| | L 1 | PU59152-R22K | PEAKING COIL |
| | L 2 | PU59152-100J | PEAKING COIL |
| | L 7 | PU59152-1R0K | PEAKING COIL |
| | L 8 | PU59152-1R0K | PEAKING COIL |
| | L 9 | PU59152-2R7J | PEAKING COIL |
| ⚠ | X 1 | PU58554-2 | CRYSTAL RESONATOR, 4.0M |
| | HD1 | PU36416-1-3 | HOLDER |
| | WR1 | PW30401-AE10S | COAXIAL CORD |
| | WR2 | PW30401-AE10S | COAXIAL CORD |
| | CN 2 | PU58844-9 | CAP HOUSING |
| | CN 3 | PU58844-2 | CAP HOUSING |
| | CN 4 | PU59555-5 | CAP HOUSING |
| | CN 5 | PU58844-6 | CAP HOUSING |
| ⚠ | CP 1 | ICP-F10 | CIRCUIT PROTECTOR |

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## AUDIO BOARD ASSEMBLY <09>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB20246A-01 | AUDIO BOARD ASSEMBLY |
| | IC1 | AN3380NK | IC |
| | IC2 | TA7361AP | IC |
| | IC3 | PB20167A-01 | FMA MODULE. |
| | IC101 | UPC78N05 | IC |
| | Q1 | 2SC1740S(RS) | TRANSISTOR |
| | OR | 2SC3199(GB)-TJK | TRANSISTOR |
| | Q2 | 2SC3311(RS) | TRANSISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | OR | 2SC3199(GB)-TJK | TRANSISTOR |
| | Q3 | DTC114ES | TRANSISTOR |
| | Q4 | 2SC1740S(RS) | TRANSISTOR |
| | OR | 2SC3199(GB)-TJK | TRANSISTOR |
| | Q5 | DTC114ES | TRANSISTOR |
| | Q6 | DTC114ES | TRANSISTOR |
| | Q7 | DTC114ES | TRANSISTOR |
| | Q8 | DTA114ES | TRANSISTOR |
| | Q9 | DTA114ES | TRANSISTOR |
| | Q11 | 2SC1740S(RS) | TRANSISTOR |
| | OR | 2SC3199(GB)-TJK | TRANSISTOR |
| | Q12 | DTC143TS | TRANSISTOR |
| | Q13 | DTC143TS | TRANSISTOR |
| | Q16 | 2SC3311(RS) | TRANSISTOR |
| | OR | 2SC3199(GB)-TJK | TRANSISTOR |
| | Q17 | DTA114ES | TRANSISTOR |
| | Q101 | 2SD1764 | TRANSISTOR |
| | Q102 | 2SA854S(QR) | TRANSISTOR |
| | Q103 | 2SB1068(KU) | TRANSISTOR |
| | D1 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D3 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D4 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D7 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D8 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D12 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D23 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | D101 | HZ12A2 | ZENER DIODE |
| | D102 | 1SS133 | DIODE |
| | OR | MA165 | DIODE |
| | R3 | QRD161J-102 | RESISTOR |
| | R4 | QRD161J-682 | RESISTOR |
| | R5 | QRD161J-151 | RESISTOR |
| | R6 | QRD161J-152 | RESISTOR |
| | R7 | QRD161J-222 | RESISTOR |
| | R8 | QRD161J-100 | RESISTOR |
| | R9 | QVZ3518-473 | V RESISTOR |
| | R10 | QRD161J-333 | RESISTOR |
| | R11 | QRD161J-473 | RESISTOR |
| | R12 | QRD161J-101 | RESISTOR |
| | R13 | QRD161J-473 | RESISTOR |
| | R14 | QRD161J-6R8 | RESISTOR |
| | R15 | QRD161J-103 | RESISTOR |
| | R18 | QRD161J-153 | RESISTOR |
| | R20 | QRD161J-103 | RESISTOR |
| | R21 | QRD161J-680 | RESISTOR |
| | R22 | QRD161J-750 | RESISTOR |
| | R23 | QRD161J-303 | RESISTOR |
| | R25 | QRD162J-103 | RESISTOR |
| | R26 | QRD161J-154 | RESISTOR |
| | R27 | QRD161J-561 | RESISTOR |
| | R28 | QVZ3518-102 | V RESISTOR |
| | R29 | QRD161J-102 | RESISTOR |
| | R31 | QRD161J-151 | RESISTOR |
| | R32 | QRD161J-102 | RESISTOR |
| | R33 | QRD161J-102 | RESISTOR |
| | R34 | QRD161J-151 | RESISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | R42 | QRD161J-223 | RESISTOR |
| | R43 | QRD161J-101 | RESISTOR |
| | R44 | QRD161J-101 | RESISTOR |
| | R45 | QRD161J-392 | RESISTOR |
| | R46 | QRD161J-332 | RESISTOR |
| | R47 | QRD161J-153 | RESISTOR |
| | R48 | QRD161J-223 | RESISTOR |
| | R49 | QRD161J-274 | RESISTOR |
| | R50 | QRD161J-222 | RESISTOR |
| | R51 | QRD161J-222 | RESISTOR |
| | R53 | QRD161J-333 | RESISTOR |
| | R58 | QRD161J-333 | RESISTOR |
| | R59 | QRD161J-333 | RESISTOR |
| | R60 | QRD161J-333 | RESISTOR |
| | R62 | QRD161J-333 | RESISTOR |
| | R63 | QRD161J-102 | RESISTOR |
| | R64 | QRD161J-331 | RESISTOR |
| | R65 | QRD161J-393 | RESISTOR |
| | R66 | QRD161J-8R2 | RESISTOR |
| | R67 | QRD161J-333 | RESISTOR |
| | R68 | QRD161J-333 | RESISTOR |
| | R69 | QRD161J-390 | RESISTOR |
| | R70 | QRD161J-273 | RESISTOR |
| | R72 | QRD161J-392 | RESISTOR |
| | R73 | QRD162J-392 | RESISTOR |
| | R74 | QRD162J-392 | RESISTOR |
| | R78 | QRD181J-0R0 | RESISTOR |
| | R79 | QRD162J-122 | RESISTOR |
| | R80 | QRD162J-122 | RESISTOR |
| | R81 | QRD161J-103 | RESISTOR |
| | R82 | QRD161J-153 | RESISTOR |
| | R85 | QRD161J-222 | RESISTOR |
| | R86 | QRD161J-103 | RESISTOR |
| | R90 | QRD161J-103 | RESISTOR |
| | R101 | QRD161J-182 | RESISTOR |
| | R103 | QRD161J-103 | RESISTOR |
| | R104 | QRD161J-222 | RESISTOR |
| | R105 | QRD161J-103 | RESISTOR |
| | R106 | QRD161J-681 | RESISTOR |
| | C1 | QETC1CM-106 | E CAPACITOR |
| | C2 | QETB1AM-476 | E CAPACITOR |
| | C3 | QEP61CM-106 | NP E CAPACITOR |
| | C4 | QETB1CM-106 | E CAPACITOR |
| | C6 | QETB1AM-336 | E CAPACITOR |
| | C7 | QETC1AM-476 | E CAPACITOR |
| | C8 | QCBB1HK-102 | CAPACITOR |
| | C9 | QCBB1HK-101 | CAPACITOR |
| | C10 | QETC1AM-336 | E CAPACITOR |
| | C11 | QETC1AM-107 | E CAPACITOR |
| | C13 | QETB1CM-106 | E CAPACITOR |
| | C14 | QEP61CM-106 | NP E CAPACITOR |
| | C15 | QETC1AM-476 | E CAPACITOR |
| | C16 | QETC1CM-106 | E CAPACITOR |
| | C17 | QCBB1HJ-331 | CAPACITOR |
| | C18 | QFV71HJ-223 | M CAPACITOR |
| | OR | QFN31HJ-223 | M CAPACITOR |
| | C19 | QCC11EJ-102 | CAPACITOR |
| | C20 | QCC11EJ-102 | CAPACITOR |
| | C21 | QETC1CM-106 | E CAPACITOR |
| | C22 | QETC1EM-475 | E CAPACITOR |
| | C24 | QCXB1CM-222 | CAPACITOR |
| | C25 | QETC1HM-225 | E CAPACITOR |
| | C26 | QETC1AM-336 | E CAPACITOR |
| | C27 | QETC0JM-476 | E CAPACITOR |
| | C28 | QFV81HJ-104 | M CAPACITOR |
| | OR | QFN31HJ-104 | M CAPACITOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | C29 | QFN31HJ-563 | M CAPACITOR |
| | C30 | QETC1CM-106 | E CAPACITOR |
| | C32 | QFN31HJ-103 | M CAPACITOR |
| | C33 | QFV71HJ-564 | M CAPACITOR |
| | C34 | QEB61CM-226 | LL CAP |
| | C35 | QEB51HM-105 | E CAPACITOR |
| | C36 | QETC1CM-106 | E CAPACITOR |
| | C37 | QETC1AM-336 | E CAPACITOR |
| | C38 | QETC1CM-476 | E CAPACITOR |
| | C39 | QETC1AM-336 | E CAPACITOR |
| | C40 | QETC1CM-106 | E CAPACITOR |
| | C41 | QETC1CM-476 | E CAPACITOR |
| | C42 | QETC1HM-225 | E CAPACITOR |
| | C43 | QETC1CM-106 | E CAPACITOR |
| | C44 | QETC1HM-225 | E CAPACITOR |
| | C45 | QEN61HM-225 | NP E CAPACITOR |
| | C46 | QEN61HM-225 | NP E CAPACITOR |
| | C47 | QETC1HM-225 | E CAPACITOR |
| | C48 | QETC1HM-104 | E CAPACITOR |
| | C49 | QCF31HP-223 | CAPACITOR |
| | C50 | QFV81HJ-104 | M CAPACITOR |
| | | OR QFN31HJ-104 | M CAPACITOR |
| | C51 | QFV71HJ-104 | M CAPACITOR |
| | | OR QFN31HJ-104 | M CAPACITOR |
| | C52 | QFV71HJ-104 | M CAPACITOR |
| | | OR QFN31HJ-104 | M CAPACITOR |
| | C53 | QCF31HP-223 | CAPACITOR |
| | C54 | QETC1AM-107 | E CAPACITOR |
| | C55 | QCVB1CN-103 | CAPACITOR |
| | C56 | QCBB1HJ-102 | CAPACITOR |
| | C57 | QCSB1HJ-330 | CAPACITOR |
| | C58 | QCBB1HJ-331 | CAPACITOR |
| | C59 | QCBB1HJ-102 | CAPACITOR |
| | C60 | QCVB1CN-103 | CAPACITOR |
| | C63 | QCC11EJ-182 | CAPACITOR |
| | C67 | QETC1CM-106 | E CAPACITOR |
| | C72 | QCBB1HK-561 | CAPACITOR |
| | C73 | QCBB1HK-561 | CAPACITOR |
| | C74 | QCC11EJ-102 | CAPACITOR |
| | C75 | QCC11EJ-102 | CAPACITOR |
| | C76 | QFV71HJ-333 | M CAPACITOR |
| | | OR QFN31HJ-333 | M CAPACITOR |
| | C77 | QETC1CM-106 | E CAPACITOR |
| | C78 | QFV71HJ-104 | M CAPACITOR |
| | | OR QFN31HJ-104 | M CAPACITOR |
| | C79 | QCC11EJ-273 | CAPACITOR |
| | C83 | QCBC1HJ-821 | CAPACITOR |
| | C101 | QETC1EM-476 | E CAPACITOR |
| | C102 | QCBB1HK-102 | CAPACITOR |
| | C103 | QEK61HM-105 | E CAPACITOR |
| | C104 | QETB1CM-106 | E CAPACITOR |
| | L1 | PU54223-101J | PEAKING COIL |
| | L3 | PU58308-392J | COIL |
| | L4 | PU54223-221J | PEAKING COIL |
| | L5 | PU54223-101J | PEAKING COIL |
| | BPF1 | PU60610 | BPF(1.4MHZ) |
| | BPF2 | PU60611 | BPF(1.8MHZ) |
| ⚠ | T1 | PU60303 | OSC TRANSFORMER |
| ⚠ | T2 | PU60304 | OSC TRANSFORMER |
| | HN1 | PU58018-1-2 | PWB HINGE |
| ⚠ | HS1 | PU60185 | HEAT SINK, FOR Q101 |
| | HS2 | PU60261 | HEAT SINK, FOR IC101 |
| | SCW1 | DPSP3008Z | SCREW, FOR Q101 |
| | SLD1 | PU59960 | P/R AMP SHIELD1 |
| | SLD2 | PU59961 | P/R AMP SHIELD2 |
| | SLD3 | PU59962 | P/R AMP SHIELD3 |
| | TP31 | PU55774 | TEST PIN, X6(31-34,53,GND) |
| | CN1 | PU58844-3 | CAP HOUSING |
| | CN2 | PU59555-9 | CAP HOUSING |
| | CN3 | PU58844-2 | CAP HOUSING |
| | CN4 | PU58844-4 | CAP HOUSING |
| | CN5 | PU58844-4 | CAP HOUSING |
| | CN6 | PU58844-2 | CAP HOUSING |
| | CN7 | PU58844-4 | CAP HOUSING |
| | CN8 | PU58844-4 | CAP HOUSING |
| | CN9 | PU58844-5 | CAP HOUSING |
| | CN10 | PU59555-4 | CAP HOUSING |
| | CN11 | PU58844-4R | CAP HOUSING |
| | CN12 | PU58844-2R | CAP HOUSING |
| | CN13 | PU58844-5 | CAP HOUSING |

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## AUDIO CONTROL HEAD BOARD <12>

| | | | |
|---|---|---|---|
| | PWBA | PB40029 | AC HEAD BOARD |
| | CN1 | PU58844-103B | CAP HOUSING |
| | CN2 | PU58844-104 | CAP HOUSING |

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## DEMODULATOR BOARD ASSEMBLY <14>

| | | | |
|---|---|---|---|
| | PWBA | PB20240A | DEMODULATOR BOARD ASSEMBLY |
| | IC1 | TDA3800GS | IC |
| | Q1 | DTC114ES | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | Q2 | 2SD1292(QR) | TRANSISTOR |
| | | OR 2SC3068 | TRANSISTOR |
| | Q3 | DTC114ES | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | Q4 | DTC114ES | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | Q5 | DTC114ES | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | Q6 | DTC114ES | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | Q7 | DTC144ES | TRANSISTOR |
| | | OR UN4213 | TRANSISTOR |
| | | OR 2SC3399 | TRANSISTOR |
| | Q8 | DTC114ES | TRANSISTOR |
| | | OR UN4211 | TRANSISTOR |
| | | OR 2SC3402 | TRANSISTOR |
| | Q9 | 2SD1450S,T | TRANSISTOR |
| | | OR 2SD1292(QR) | TRANSISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | Q10 | 2SD1450S,T | TRANSISTOR |
| | | OR 2SD1292(QR) | TRANSISTOR |
| | D1 | 1SS133 | DIODE |
| | D2 | 1SS133 | DIODE |
| | D3 | 1SS133 | DIODE |
| | D4 | 1SS133 | DIODE |
| | D6 | 1SS133 | DIODE |
| | R1 | QRD161J-103 | RESISTOR |
| | R2 | QVZ3518-103 | V RESISTOR |
| | R3 | QRD161J-153 | RESISTOR |
| | R4 | QRD161J-331 | RESISTOR |
| | R5 | QRD161J-821 | RESISTOR |
| | R6 | QRD161J-102 | RESISTOR |
| | R7 | QRD161J-104 | RESISTOR |
| | R8 | QRD161J-154 | RESISTOR |
| | R9 | QRD161J-271 | RESISTOR |
| | R10 | QRD161J-273 | RESISTOR |
| | R11 | QRD161J-103 | RESISTOR |
| | R12 | QRD161J-103 | RESISTOR |
| | R13 | QRD161J-103 | RESISTOR |
| | R14 | QRD161J-103 | RESISTOR |
| | R15 | QRD161J-103 | RESISTOR |
| | R16 | QRD161J-103 | RESISTOR |
| | R17 | QRD161J-103 | RESISTOR |
| | R21 | QVZ3518-332 | V RESISTOR |
| | R22 | QRD161J-222 | RESISTOR |
| | R23 | QRD161J-103 | RESISTOR |
| | R24 | QVZ3518-332 | V RESISTOR |
| | R25 | QRD161J-222 | RESISTOR |
| | R26 | QRD161J-103 | RESISTOR |
| | C1 | QETC1CM-106 | E CAPACITOR |
| | C2 | QFN31HK-392 | M CAPACITOR |
| | C3 | QFN31HK-392 | M CAPACITOR |
| | C4 | QFN31HK-392 | M CAPACITOR |
| | C5 | QETC1CM-106 | E CAPACITOR |
| | C6 | QETC1CM-106 | E CAPACITOR |
| | C7 | QETC1CM-476 | E CAPACITOR |
| | C8 | QCF31HP-223 | CAPACITOR |
| | C9 | QCC11EK-473 | CAPACITOR |
| | C10 | QFP31HJ-102 | M CAPACITOR |
| | C11 | QETC1CM-477 | E CAPACITOR |
| | C12 | QCC11EK-473 | CAPACITOR |
| | C13 | QETC1CM-106 | E CAPACITOR |
| | C14 | QETC1CM-106 | E CAPACITOR |
| | C15 | QETC1CM-336 | E CAPACITOR |
| | C16 | QETC1CM-107 | E CAPACITOR |
| | C17 | QETC1HM-105 | E CAPACITOR |
| | C18 | QETC1CM-476 | E CAPACITOR |
| | C20 | QETC1CM-106 | E CAPACITOR |
| | BPF1 | PU58226 | BAND PASS FILTER |
| | CF1 | PU52775 | CERAMIC FILTER |
| | CF2 | PU52775-2 | CERAMIC FILTER |
| | T1 | PU59489 | COIL |
| | T2 | PU59490 | COIL |
| | CN1 | PU58844-6 | CAP HOUSING |
| | CN2 | PU58844-4 | CAP HOUSING |
| | CN3 | PU59555-4 | CAP HOUSING |

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## * TIMER BOARD ASSEMBLY <20> *

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| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB10143A1-01 | TIMER BOARD ASSY,EG |
| | | PB10143D1-01 | TIMER BOARD ASSY,E |
| | IC1 | UPD75216ACW-163 | IC |
| | IC2 | S-8053HNB | IC |
| | IC301 | SDA5642 | IC, EG |
| ⚠ | Q1 | 2SD1863(QR) | TRANSISTOR |
| | Q2 | 2SC3311A(RS) | TRANSISTOR |
| | Q3 | DTC124ES | TRANSISTOR |
| | Q4 | 2SC3311A(RS) | TRANSISTOR |
| | Q5 | DTC124ES | TRANSISTOR |
| | Q6 | DTC124ES | TRANSISTOR |
| | D1 | RD9.1ES-T1B2 | ZENER DIODE |
| | | OR HZS9.1EB2TJ | ZENER DIODE |
| | D2 | DA210S | DIODE |
| | D3 | MTZJ5.1B | ZENER DIODE |
| | | OR RD5.1ES-T1B2 | ZENER DIODE |
| | D4 | MTZ8.2B | ZENER DIODE |
| | | OR RD8.2ES-T1B2 | ZENER DIODE |
| | D5 | MTZ8.2B | ZENER DIODE |
| | | OR RD8.2ES-T1B2 | ZENER DIODE |
| | D6 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D7 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D8 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D9 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D10 | 1SS133 | DIODE |
| | | OR MA165 | DIODE |
| | D25 | 1SS133 | DIODE |
| | D26 | 1SS133 | DIODE |
| | D29 | 1SS133 | DIODE |
| | D30 | 1SS133 | DIODE |
| | D35 | 1SS133 | DIODE |
| | R1 | QRD161J-121 | RESISTOR |
| | R2 | QRD161J-222 | RESISTOR |
| | R3 | QRD161J-103 | RESISTOR |
| | R4 | QRD161J-682 | RESISTOR |
| | R5 | QRD161J-104 | RESISTOR |
| | R6 | QRD161J-151 | RESISTOR |
| | R7 | QRD161J-102 | RESISTOR |
| | R8 | QRD161J-104 | RESISTOR |
| | R9 | QRD161J-472 | RESISTOR |
| | R10 | QRD161J-102 | RESISTOR |
| | R11 | QRD161J-102 | RESISTOR |
| | R12 | QRD161J-102 | RESISTOR |
| | R13 | QRD161J-102 | RESISTOR |
| | R14 | QRD161J-102 | RESISTOR |
| | R15 | QRD161J-102 | RESISTOR |
| | R16 | QRD161J-102 | RESISTOR |
| | R17 | QRD161J-102 | RESISTOR |
| | R19 | QRD161J-102 | RESISTOR |
| | R20 | QRD161J-102 | RESISTOR |
| | R21 | QRD161J-102 | RESISTOR |
| | R22 | QRD161J-472 | RESISTOR |
| | R23 | QRD161J-472 | RESISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | R24 | QRD161J-472 | RESISTOR |
| | R25 | QRD161J-472 | RESISTOR |
| | R26 | QRD161J-102 | RESISTOR |
| | R29 | QRD161J-472 | RESISTOR |
| | R30 | QRD161J-472 | RESISTOR |
| | R31 | QRD161J-472 | RESISTOR |
| | R32 | QRD161J-472 | RESISTOR |
| | R33 | QRD161J-472 | RESISTOR |
| | R34 | QRD161J-472 | RESISTOR |
| | R35 | QRD161J-472 | RESISTOR |
| | R36 | QRD161J-472 | RESISTOR |
| | R37 | QRD161J-472 | RESISTOR |
| | R38 | QRD161J-472 | RESISTOR |
| | R39 | QRD161J-472 | RESISTOR |
| | R40 | QRD161J-472 | RESISTOR |
| | R41 | QRD161J-472 | RESISTOR |
| | R42 | QRD161J-472 | RESISTOR |
| | R43 | QRD161J-333 | RESISTOR |
| | R44 | QRD161J-472 | RESISTOR |
| | R45 | QRD161J-472 | RESISTOR |
| | R46 | QRD161J-102 | RESISTOR |
| | R47 | QRD161J-333 | RESISTOR |
| | R49 | QRD161J-272 | RESISTOR |
| | R301 | QRD161J-824 | RESISTOR, EG |
| | R302 | QRD161J-101 | RESISTOR, EG |
| | R303 | QRD161J-562 | RESISTOR, EG |
| | R304 | QRD161J-104 | RESISTOR, EG |
| | R305 | QRD161J-103 | RESISTOR, EG |
| | R306 | QRD161J-103 | RESISTOR, EG |
| | R307 | QRD161J-105 | RESISTOR, EG |
| | R308 | QRD161J-824 | RESISTOR, EG |
| | R309 | QRD161J-104 | RESISTOR, EG |
| | R310 | QRD161J-202 | RESISTOR, EG |
| | RA1 | QRB067J-224 | RESISTOR ARRAY |
| | OR | QRB069J-224 | RESISTOR ARRAY |
| | OR | QRB069J-224C | RESISTOR ARRAY |
| | RA2 | QRB067J-104 | NETWORK RESISTOR |
| | OR | QRB069J-104C | RESISTOR ARRAY |
| | OR | QRB069J-104 | NETWORK RESISTOR |
| | RA3 | QRB047J-333 | RESISTOR ARRAY |
| | OR | QRB049J-333 | RARRAY |
| | OR | QRB049J-333C | RESISTOR ARRAY |
| | RA4 | QRB037J-104 | NETWORK RESISTOR |
| | OR | QRB039J-104C | RESISTOR ARRAY |
| | OR | QRB039J-104 | NETWORK RESISTOR |
| | C1 | QETC1CM-336 | E CAPACITOR |
| | C2 | QETC1HM-335 | E CAPACITOR |
| | C3 | QCBB1HJ-102 | CAPACITOR |
| | C4 | PU60676-473 | E CAPACITOR |
| | OR | QEA40HZ-473 | E CAPACITOR (DOUBLE) |
| | C5 | QETC1AM-336 | E CAPACITOR |
| | C6 | QETC0JM-336 | E CAPACITOR |
| | C7 | QCVB1CN-103 | CAPACITOR |
| | C8 | QETC1CM-106 | E CAPACITOR |
| | C9 | QCVB1CN-103 | CAPACITOR |
| | C10 | PU57672-200 | TRIMMER CAPACITOR |
| | C11 | QCT30CH-120 | CAPACITOR |
| | C301 | QFN31HJ-103 | M CAPACITOR, EG |
| | C302 | QFN31HJ-333 | M CAPACITOR, EG |
| | C303 | QFN31HJ-103 | M CAPACITOR, EG |
| | C304 | QETC1HM-104 | E CAPACITOR, EG |
| | C305 | QCBB1HJ-151 | CAPACITOR, EG |
| | L1 | PU48530-101K | PEAKING COIL |
| ⚠ | X1 | PU60226 | CRYSTAL RESONATOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| ⚠ | CP1 | ICP-F10 | CIRCUIT PROTECTOR |

* * *

## OPERATION BOARD ASSEMBLY <22>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB20071H1 | OP.BOARD ASSY |
| | IC201 | GP1U501 | INFRARED RAYS UNIT |
| | OR | SPS-413 | INFRARED RAYS UNIT |
| | D200 | MTZ5.1B | ZENER DIODE |
| | D201 | SLR-55MC3F | LE DIODE |
| | D202 | SLR-55MC3F | LE DIODE |
| | R200 | QRD161J-821 | RESISTOR |
| | R208 | QRD161J-102 | RESISTOR |
| | R211 | QRD161J-102 | RESISTOR |
| | R212 | QRD161J-122 | RESISTOR |
| | R213 | QRD161J-222 | RESISTOR |
| | R214 | QRD161J-332 | RESISTOR |
| | R216 | QRD161J-122 | RESISTOR |
| | R217 | QRD161J-222 | RESISTOR |
| | R219 | QRD161J-223 | RESISTOR |
| | R220 | QRD161J-563 | RESISTOR |
| | R221 | QRD161J-471 | RESISTOR |
| | R227 | QRD161J-103 | RESISTOR |
| | R231 | QRD161J-103 | RESISTOR |
| | R404 | PU60298 | V RESISTOR |
| | S15 | PU57550 | TACT SWITCH |
| | S201 | PU57550 | TACT SWITCH |
| | S203 | PU57550 | TACT SWITCH |
| | S204 | PU57550 | TACT SWITCH |
| | S205 | PU57550 | TACT SWITCH |
| | S206 | PU57550 | TACT SWITCH |
| | S207 | PU57550 | TACT SWITCH |
| | S208 | PU57550 | TACT SWITCH |
| | S212 | PU57550 | TACT SWITCH |
| | S216 | PU57550 | TACT SWITCH |
| | S217 | PU57550 | TACT SWITCH |
| | J401 | PU58356-2 | JACK(HEADPHONE) |
| | CN201 | PU59513-4 | CAP HOUSING |
| | CN202 | PU59555-105 | CAP HOUSING |
| | CN204 | PU59513-2 | CAP HOUSING |
| | CN205 | PU59555-102 | CAP HOUSING |

* * *

## SW/DISPLAY BOARD ASSEMBLY <28>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB10143A2-01 | SW/DISPLAY BOARD ASSY,FOR EG |
| | | PB10143D2-01 | SW/DISPLAY BOARD ASSY,FOR E |
| | IC101 | MSC7112-01SS | IC |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | IC102 | M50255P | IC |
| | IC103 | PU60764 | LEVEL IND ASSY |
| | Q101 | 2SK658 | FE TRANSISTOR |
| | D106 | SLH-34VR3F | LE DIODE |
| | D107 | SLH-34VR3F | LE DIODE |
| | D109 | SLR-55VC3F | LE DIODE |
| | D110 | SLR-55MC3F | LE DIODE |
| | D111 | SLR-55DC3F | LE DIODE |
| | D112 | SLR-55VC3F | LE DIODE |
| | D113 | SLH-34VR3F | LE DIODE |
| | D114 | SLH-34VR3F | LE DIODE |
| | D115 | SLH-34VR3F | LE DIODE |
| | D116 | SLH-34VR3F | LE DIODE |
| | D117 | SLR-34MC3F | LE DIODE |
| | R104 | QRD161J-273 | RESISTOR |
| | R105 | QRD161J-102 | RESISTOR |
| | R106 | QRD161J-102 | RESISTOR |
| | R107 | QRD161J-102 | RESISTOR |
| | R108 | QRD161J-102 | RESISTOR |
| | R110 | QRD161J-333 | RESISTOR |
| | R111 | QRD161J-271 | RESISTOR |
| | R112 | QRD161J-271 | RESISTOR |
| | R113 | QRD161J-472 | RESISTOR |
| | R114 | QRD161J-472 | RESISTOR |
| | R115 | QRD161J-823 | RESISTOR |
| | R116 | QRD161J-333 | RESISTOR |
| | R117 | QRD161J-333 | RESISTOR |
| | R118 | QRD161J-271 | RESISTOR |
| | R119 | QRD161J-271 | RESISTOR |
| | R120 | QRD161J-271 | RESISTOR |
| | R121 | PU59166 | V RESISTOR |
| | R122 | QRD161J-271 | RESISTOR |
| | R123 | QRD161J-271 | RESISTOR |
| | R124 | QRD161J-271 | RESISTOR |
| | R125 | QRD161J-271 | RESISTOR |
| | R126 | QRD161J-271 | RESISTOR |
| | R127 | QRD161J-271 | RESISTOR |
| | R128 | QRD161J-271 | RESISTOR |
| | R129 | QRD161J-333 | RESISTOR |
| | R215 | QRD161J-472 | RESISTOR |
| | R225 | QRD161J-332 | RESISTOR |
| | R226 | QRD161J-472 | RESISTOR |
| | R228 | QRD161J-103 | RESISTOR |
| | R229 | QRD161J-223 | RESISTOR |
| | C101 | QER61VM-106 | E CAPACITOR |
| | C102 | QER60JM-336 | E CAPACITOR |
| | C103 | QCVB1CN-103 | CAPACITOR |
| | C104 | QER61HM-104 | E CAPACITOR |
| | C105 | QCBB1HJ-101 | CAPACITOR |
| | C106 | QCSB1HJ-330 | CAPACITOR |
| | C107 | QCSB1HJ-330 | CAPACITOR |
| | S1 | PU60392-Z | TACT SWITCH |
| | S2 | PU60392-Z | TACT SWITCH |
| | S3 | PU60392-Z | TACT SWITCH |
| | S4 | PU60392-Z | TACT SWITCH |
| | S5 | PU60392-Z | TACT SWITCH |
| | S6 | PU60392-Z | TACT SWITCH |
| | S7 | PU60392-Z | TACT SWITCH |
| | S8 | PU60392-Z | TACT SWITCH |
| | S9 | PU60392-Z | TACT SWITCH |
| | S10 | PU60392-Z | TACT SWITCH |
| | S12 | PU60392-Z | TACT SWITCH |
| | S13 | PU60392-Z | TACT SWITCH |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | S14 | PU60392-Z | TACT SWITCH |
| | S16 | PU60392-Z | TACT SWITCH |
| | S17 | PU60392-Z | TACT SWITCH |
| | S18 | PU60392-Z | TACT SWITCH |
| | S19 | PU60392-Z | TACT SWITCH |
| | S20 | PU60392-Z | TACT SWITCH |
| | S21 | PU60392-Z | TACT SWITCH |
| | S22 | PU60392-Z | TACT SWITCH |
| | S23 | PU60392-Z | TACT SWITCH |
| | S24 | PU60392-Z | TACT SWITCH |
| | S25 | PU60392-Z | TACT SWITCH |
| | S26 | PU60392-Z | TACT SWITCH |
| | S27 | PU60392-Z | TACT SWITCH |
| | S29 | PU60392-Z | TACT SWITCH |
| | S210 | PU60392-Z | TACT SWITCH |
| | S211 | PU60392-Z | TACT SWITCH |
| | S212 | PU60392-Z | TACT SWITCH |
| | S213 | PU60392-Z | TACT SWITCH |
| | S214 | PU60392-Z | TACT SWITCH |
| | S215 | PU60392-Z | TACT SWITCH |
| | S402 | PU58486-1-1 | SLIDE SWITCH |
| | S404 | PU58486-1-1 | SLIDE SWITCH |
| | FDP1 | PU60500-2 | FLUORESCENT DISPLAY PANEL,EG |
| | | PU60500 | FLUORESCENT DISPLAY PANEL,E |
| | HD1 | PQ31355-1-2 | FDP HOLDER(R) |
| | HD2 | PQ31356-1-2 | FDP HOLDER(L) |
| | J5 | PU58355-2 | MIC JACK |

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### UPPER DRUM BOARD <41>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWB1 | PDM3207 | UPPER DRUM BOARD |

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### PRE/REC AMP BOARD ASSEMBLY <43>

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | PWBA | PB30025F | PRE/REC BOARD ASSEMBLY |
| | IC1 | HA118019NT | IC |
| | Q1 | 2SA1309R,S | TRANSISTOR |
| | Q2 | 2SA1309R,S | TRANSISTOR |
| | Q3 | 2SC1740S(RS) | TRANSISTOR |
| | Q4 | 2SC1740S(RS) | TRANSISTOR |
| | Q6 | DTC124ES | TRANSISTOR |
| | Q7 | DTC144WS | TRANSISTOR |
| | Q8 | DTC124ES | TRANSISTOR |
| | D1 | MA165 | DIODE |
| | | OR 1SS133 | DIODE |
| | D2 | MA165 | DIODE |
| | | OR 1SS133 | DIODE |
| | D3 | MA165 | DIODE |
| | | OR 1SS133 | DIODE |
| | R1 | QRD161J-102 | RESISTOR |
| | R2 | QRD161J-182 | RESISTOR |
| | R3 | QRD161J-222 | RESISTOR |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | R4 | QRD161J-561 | RESISTOR |
| | R5 | QRD161J-681 | RESISTOR |
| | R6 | QRD161J-681 | RESISTOR |
| | R7 | QRD161J-332 | RESISTOR |
| | R8 | QRD161J-562 | RESISTOR |
| | R9 | QRD161J-102 | RESISTOR |
| | R10 | QRD161J-102 | RESISTOR |
| | R11 | QRD161J-681 | RESISTOR |
| | R12 | QRD161J-122 | RESISTOR |
| | R13 | QRD161J-681 | RESISTOR |
| | R14 | QRD161J-102 | RESISTOR |
| | R15 | QRD161J-182 | RESISTOR |
| | R16 | QRD161J-222 | RESISTOR |
| | R17 | QRD161J-223 | RESISTOR |
| | R18 | QRD161J-223 | RESISTOR |
| | R19 | QRD161J-223 | RESISTOR |
| | R20 | QRD161J-184 | RESISTOR |
| | R21 | QRD161J-223 | RESISTOR |
| | R22 | QRD161J-474 | RESISTOR |
| | R23 | QRD161J-223 | RESISTOR |
| | R24 | QRD161J-103 | RESISTOR |
| | R25 | QRD162J-103 | RESISTOR |
| | R26 | QRD161J-103 | RESISTOR |
| | R27 | QRD161J-103 | RESISTOR |
| | R30 | QRD161J-820 | RESISTOR |
| | R31 | QRD161J-820 | RESISTOR |
| | R33 | QRD162J-820 | RESISTOR |
| | C1 | QCBB1HJ-471 | CAPACITOR |
| | C2 | QCSB1HJ-180 | CAPACITOR |
| | C3 | QCVB1CN-103 | CAPACITOR |
| | C4 | QCSB1HJ-180 | CAPACITOR |
| | C5 | QCSB1HJ-100 | CAPACITOR |
| | C6 | QCVB1CN-103 | CAPACITOR |
| | C7 | QCSB1HJ-200 | CAPACITOR |
| | C8 | QCBB1HJ-681 | CAPACITOR |
| | C9 | QCSB1HJ-240 | CAPACITOR |
| | C11 | QCSB1HJ-220 | CAPACITOR |
| | C13 | QCVB1CN-103 | CAPACITOR |
| | C14 | QCC11EJ-473 | CAPACITOR |
| | C16 | QETC0JM-476 | E CAPACITOR |
| | C17 | QCVB1CN-103 | CAPACITOR |
| | C18 | QCBC1HJ-681 | CAPACITOR |
| | C19 | QETC1HM-104 | E CAPACITOR |
| | C20 | QCVB1CN-103 | CAPACITOR |
| | C21 | QCSB1HJ-680 | CAPACITOR |
| | C22 | QCVB1CN-103 | CAPACITOR |
| | C24 | QCVB1CN-103 | CAPACITOR |
| | C25 | QFZ0096-224 | MM CAPACITOR |
| | C28 | QFZ0096-224 | MM CAPACITOR |
| | C29 | QCVB1CN-103 | CAPACITOR |
| | C32 | QCVB1CN-103 | CAPACITOR |
| | C34 | QFZ0096-224 | MM CAPACITOR |
| | C35 | QCVB1CN-103 | CAPACITOR |
| | C36 | QETC0JM-476 | E CAPACITOR |
| | C37 | QCVB1CN-103 | CAPACITOR |
| | C39 | QCFB1EZ-223 | CAPACITOR |
| | L1 | PU59152-220J | PEAKING COIL |
| | L2 | PU59152-560J | PEAKING COIL |
| | L3 | PU59152-330J | PEAKING COIL |
| | L4 | PU59152-151J | PEAKING COIL |
| | L6 | PU59152-330J | PEAKING COIL |
| | L7 | PU59152-560J | PEAKING COIL |
| | L8 | PU48530-101K | PEAKING COIL |
| | L9 | PU48530-101K | PEAKING COIL |
| | L10 | PU59152-560J | PEAKING COIL |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | BKT1 | PQ42955 | PWB BRACKET |
| | ETH1 | PQ40433-2 | EARTH LUG |
| | SCW1 | DPSP2606Z | SCREW, X2 |
| | SLD1 | PQ43281 | SHIELD CASE |
| | SLD2 | PQ43282 | SHIELD PLATE |
| | SLD3 | PQ43283 | SHIELD COVER |
| | SPC1 | WBS2600Z | T.LOCK WASHER, X2 |
| | TP2 | PU57545 | TEST PIN, X3 (2, 6, GND) |
| | CN1 | PU58844-8 | CAP HOUSING |
| | CN2 | PU59555-7 | CAP HOUSING |
| | CN3 | PU56258-10 | CAP HOUSING |
| | CN4 | PU58844-3 | CAP HOUSING |

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## DECK TERMINAL BOARD ASSEMBLY <51><53>

| REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA | PB20013A-03 | DECK TERMINAL BOARD ASSY |

### -DECK TERMINAL BOARD SECTION <51>-

| REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA1 | PB20013A1 | DECK TERMINAL BOARD ASSY |
| R1 | QRD181J-151 | RESISTOR |
| R3 | QRD181J-331 | RESISTOR |
| PS1 | PU60271 | PHOTO INTERRUPTER |

### -REC SAFETY BOARD SECTION <53>-

| REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA3 | PB20013A3 | REC SAFETY BOARD ASSY |
| SW1 | PU58644-1-3 | REC SAFETY SWITCH |

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## RELAY BOARD ASSEMBLY <52>

| REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA2 | PB20013A2 | RELAY BOARD ASSY |
| LC1 | PU59736-223 | N FILTER |
| LC2 | PU59736-223 | N FILTER |
| WR1 | PW30113-G0ABZ62 | PARALLEL WIRE |
| WR2 | OR PW30118-G0ABZ62 | PARALLEL WIRE |

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## END SENSOR BOARD ASSEMBLY <54>

| REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|
| PWBA | PB20013A4 | END SENSOR BOARD ASSY |
| Q1 | PN268R-NC | PHOTO TRANSISTOR |
| HD1 | PQ31047-1-4 | E.S.HOLDER |

| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|
| | CN1 | PU59945-102 | WIRE SOCKET |

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## CASSETTE HOUSING BOARD <56>

| | | | |
|---|---|---|---|
| | PWB1 | PB30043 | CASSETTE HOUSING BOARD |
| | Q1 | PN268R-NC | PHOTO TRANSISTOR |
| | R1 | QRD162J-471 | RESISTOR |
| | PHS1 | PU58879 | PHOTO INTERRUPTER |
| | CN1 | PU58844-106 | CAP HOUSING |

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## REC PAUSE BOARD ASSEMBLY <69>

| | | | |
|---|---|---|---|
| | PWBA | PB10125A2 | REC PAUSE BOARD ASSEMBLY |
| | JC1 | PU60659 | MINI JACK |

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## MIC/MIX BOARD ASSEMBLY <76>

| | | | |
|---|---|---|---|
| | PWBA | PB30074A | MIC MIX BOARD ASSEMBLY |
| | IC1 | M5201L | IC |
| | Q4 | 2SC3311A(RS) | TRANSISTOR |
| | | OR 2SC3199(GB)-TJK | TRANSISTOR |
| | R7 | QRD161J-222 | RESISTOR |
| | R8 | QRD161J-222 | RESISTOR |
| | R9 | QRD161J-222 | RESISTOR |
| | R10 | QRD161J-222 | RESISTOR |
| | R11 | QRD161J-223 | RESISTOR |
| | R12 | QRD161J-223 | RESISTOR |
| | R13 | QRD161J-104 | RESISTOR |
| | R14 | QRD161J-221 | RESISTOR |
| | R15 | QRD161J-562 | RESISTOR |
| | R16 | QRD161J-562 | RESISTOR |
| | R17 | QRD161J-822 | RESISTOR |
| | R18 | QRD161J-822 | RESISTOR |
| | R20 | QRD161J-104 | RESISTOR |
| | R21 | QRD161J-122 | RESISTOR |
| | C1 | QEP61CM-106 | NP E CAPACITOR |
| | C2 | QEP61CM-106 | NP E CAPACITOR |
| | C6 | QETC1CM-106 | E CAPACITOR |
| | C8 | QETC1CM-476 | E CAPACITOR |
| | C9 | QETC1CM-106 | E CAPACITOR |
| | C11 | QETC1CM-476 | E CAPACITOR |

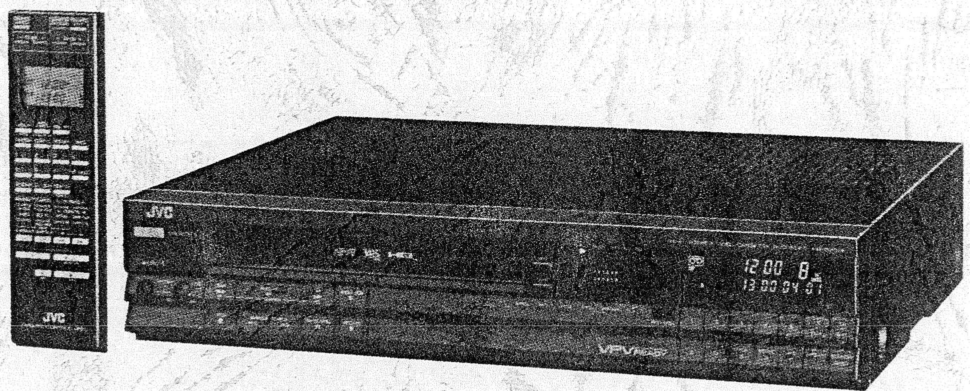
| #⚠ | REF NO. | PART NO. | PART NAME, DESCRIPTION |
|---|---|---|---|

JVC

# SERVICE MANUAL

## Hi-Fi STEREO VIDEO-KASSETTEN-REKORDER VHS

# HR-D750EG EINSTELLANWEISUNG



HQ

VPV READY
VIDEOTEXT PROGRAMMING

INDEX
VHS INDEX SEARCH SYSTEM

## TECHNISCHE DATEN

| | |
|---|---|
| Format | VHS PAL-Standard plus Hi-Fi Audio |
| Video-Aufnahmesystem | Rotierendes Zweikopfsytem, Schrägspurabtastung mit im Winkel versetzten Köpfen, ein Dual-Azimut-Kombinationskopf |
| Hi-Fi Audio-Aufnahmesystem | Tiefschicht-Aufnahmesystem nach dem Stereo Hi-Fi VHS Standard |
| Zahl der Audiokanäle | 2 Hi-Fi-Audiokanäle<br>1 herkömmlicher Audiokanal |
| Video-Signalsystem | PAL-Farb- und CCIR-Monochromsignale, 625 Linien |
| Bandbreite | 12,65 mm |
| Bandgeschwindigkeit | |
| (SP) | 23,39 mm/Sek. |
| (LP) | 11,70 mm/Sek. (nur Hi-Fi Audio) |
| Maximal-Spieldauer | |
| (SP) | 240 Min. mit E-240-Kassette |
| (LP) | 480 Min. mit E-240-Kassette (nur Hi-Fi Audio) |
| Temperaturbedingungen | |
| Betrieb | 5°C bis 40°C |
| Lagerung | –20°C bis 60°C |
| Spannungsversorgung | 220 V∿, 50/60 Hz |
| Leistungsaufnahme | 35 W |
| **Video** | |
| Eingang | 0,5 bis 2,0 Vs-s, 75 Ohm, unsymmetrisch |
| Ausgang | 1,0 V-s-s, 75 Ohm, unsymmetrisch |
| Störspannungsabstand | 43 dB (Rohde u. Schwarz-Geräuschmesser) bei BILDSCHÄRFE-Regler in Mittenposition |
| Horizontale Auflösung | 250 Linien bei BILDSCHÄRFE-Regler in Mittenposition |
| **Audio** | |
| Eingang | MIKROFON: –67 dBs, hochohmig, unsymmetrisch<br>AUDIO EING.-Buchse (RCA x 2): –8 dBs, 50 kOhm, unsymmetrisch<br>AUDIO/VIDEO-Buchse (21pol. Peri): –3,8 dBs (CENELEC-Norm), 10 kOhm, unsymmetrisch |
| Ausgangspegel | AUDIO/VIDEO-Buchse (21pol. Peri): –3,8 dBs (CENELEC-Norm), hochohmig<br>AUDIO AUSG.-Buchse (RCA x 2): –6 dBs, hochohmig |
| Ausgangsimpedanz | Weniger als 1 kOhm, unsymmetrisch |
| Störspannungsabstand | Mehr als 40 dB |
| Frequenzbereich | 70 Hz bis 10.000 Hz |
| **Hi-Fi Audio** | |
| Frequenzgang | 20 Hz bis 20.000 Hz |
| Dynamikbereich | Mehr als 90 dB |
| Gleichlaufschwankungen | Weniger als 0,005 % WRMS |
| **Fernseh-Tuner/HF-Teil** | |
| Kanalspeicherkapazität | 48 Kanäle |
| Antenneneingang | VHF 47 – 89 MHz<br>104 – 300 MHz<br>302 – 470 MHz<br>UHF 470 – 862 MHz |
| Antennenausgang | UHF-Kanäle 32 – 40 (Regelbar) |
| **Digitaluhr/Schaltuhr** | |
| Uhranzeige | 24-Stunden-Fluoreszenzdisplay mit Tages- und Datumanzeige |
| Referenzfrequenz | Quarzsteuerung |
| Startzeiteinstellung | Innerhalb von 1 Jahr |
| Programmierleistung | 8 Programme |
| Abmessungen | 435 mm(B) x 95 mm(H) x 332 mm(T) |
| Gewicht | 6,8 kg |
| Mitgeliefertes Zubehör | Antennenkabel,<br>Infrarot-Fernbedienung,<br>R6-Batterie x 2,<br>Audiokabel (RCA-RCA) |
| Sonderzubehör | VPV-Adapter (VU-V120E) |

*Die technischen Angaben beziehen sich, sofern nicht anders angegeben, auf die SP-Betriebsart.*

*Technische Änderungen vorbehalten.*

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# ABSCHNITT 1
# MECHANISCHE EINSTELLUNG

## 1.1 ALLGEMEINE BESCHREIBUNG

### 1.1.1 Vorsichtsmaßregeln

**WICHTIG:**

1. Das Gerät vor dem Ausbau oder Löten von Bauteilen vom Stromnetz abtrennen.
2. Beim Abnehmen von Befestigungsteilen (Schrauben, Unterlegscheiben usw.) darauf achten, diese nicht in den Mechanismus fallen zu lassen. Falls eine Unterlegscheibe in den Mechismus fällt, diese immer entfernen.
3. Der Bandtransportmechanismus wurde im Werk präzise eingestellt und braucht normalerweise nicht nachgestellt zu werden.
4. Beim Ausbauen von Teilen darauf achten, nicht andere Teile zu beschädigen oder auszubauen. (Besonders vorsichtig mit den Bandführungen und der Drehkopf-Videotrommel umgehen.)
5. Für Wartungsarbeiten, die erfordern, daß der Cassettenschacht vom Haupt-Deck getrennt wird, die unten aufgeführten Schritte befolgen.

1) Eine Platte isoliertes Material rechts neben das Chassis legen.
2) Den Cassettenschacht vom Haupt-Deck ausbauen und auf das isolierte Material legen, ohne dabei die Steckverbindung von der MAIN Platine abzutrennen.
3) Eine Cassette in den Cassettenschacht legen. Der Schachtmechanismus zieht die Cassette ein.
4) Den Fototransistor-Sensor (END SENSOR) auf dem Haupt-Deck mit einer undurchsichtigen Abdeckung abdecken.
5) Die gewünschten Betriebsarten können mit den Bedienungstasten eingestellt werden.

### 1.1.2 Erforderliche Prüfgeräte, Halterungen und Einstellehren

Für richtige mechanische Einstellung werden die folgenden Werkzeuge und Haltevorrichtungen dringend empfohlen. Ohne diese wäre eine lange Testbetriebszeit erforderlich, und das Gerät könnte möglicherweise beschädigt werden. Außerdem werden Normalwerkzeuge gebraucht.

1. Erforderliche Prüfgeräte
   Farbfernseher oder Monitor
   Oszilloskop: Breitband, Zweikanal, getriggert, verzögerte Zeitbasis
   Aufnahmeband
   Abgleichband

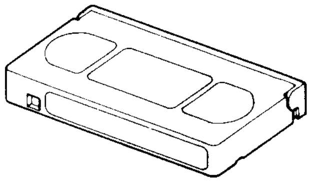
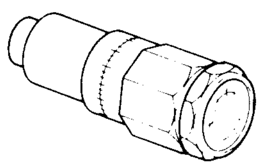
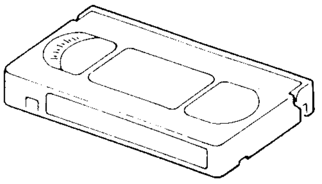
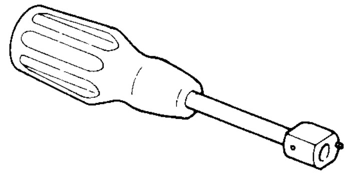
| | | |
|---|---|---|
| JVC-Abgleichband MH-2  | Drehkraftmessungs-Baugruppe PUJ48075-2  | Bandzug-Meßcassette PUJ48076-2  |
| A/CTL Kopfpositionierungs-Werkzeug PUJ47351-2  | | |

**Tabelle 1-1-1** Werkzeuge und Einstellehren

### 1.1.3 Demontage

1. Oberabdeckung
1) Fünf Schrauben von der linken, rechten und hinteren Seite des Gerätes abnehmen.
2) Das hintere Ende der Oberabdeckung zuerst abheben, und dann die Abdeckung ganz abnehmen.

2. Frontplatte
1) Die Oberabdeckung abnehmen.
2) Die drei oberen Haken der Frontplattenbaugruppe nach oben biegen, so daß sie aus ihren Chassishalterungen gelöst werden.
3) Die drei unteren Haken von der Unterseite des Geräts lösen, um die Frontplattenbaugruppe vom Chassis abzunehmen.

3. Boden platte
1) Die drei Schrauben von der Unterseile des Garäles enffernen.
2) Die Boden-platte von den sechs Haltern am Chassis lösen, um die Boden-platte zu entfernen.

4. Kassettenschachtklappe
1) Die Frontplattenbaugruppe entfernen.
2) Die Mitte der Kassettenschachtklappe nach vorne biegen, und dann das rechte Ende vom Kassettenschacht abziehen.
3) Auf die Drehfeder achten, und das linke Ende der Kassettenschachtklappe herausziehen.

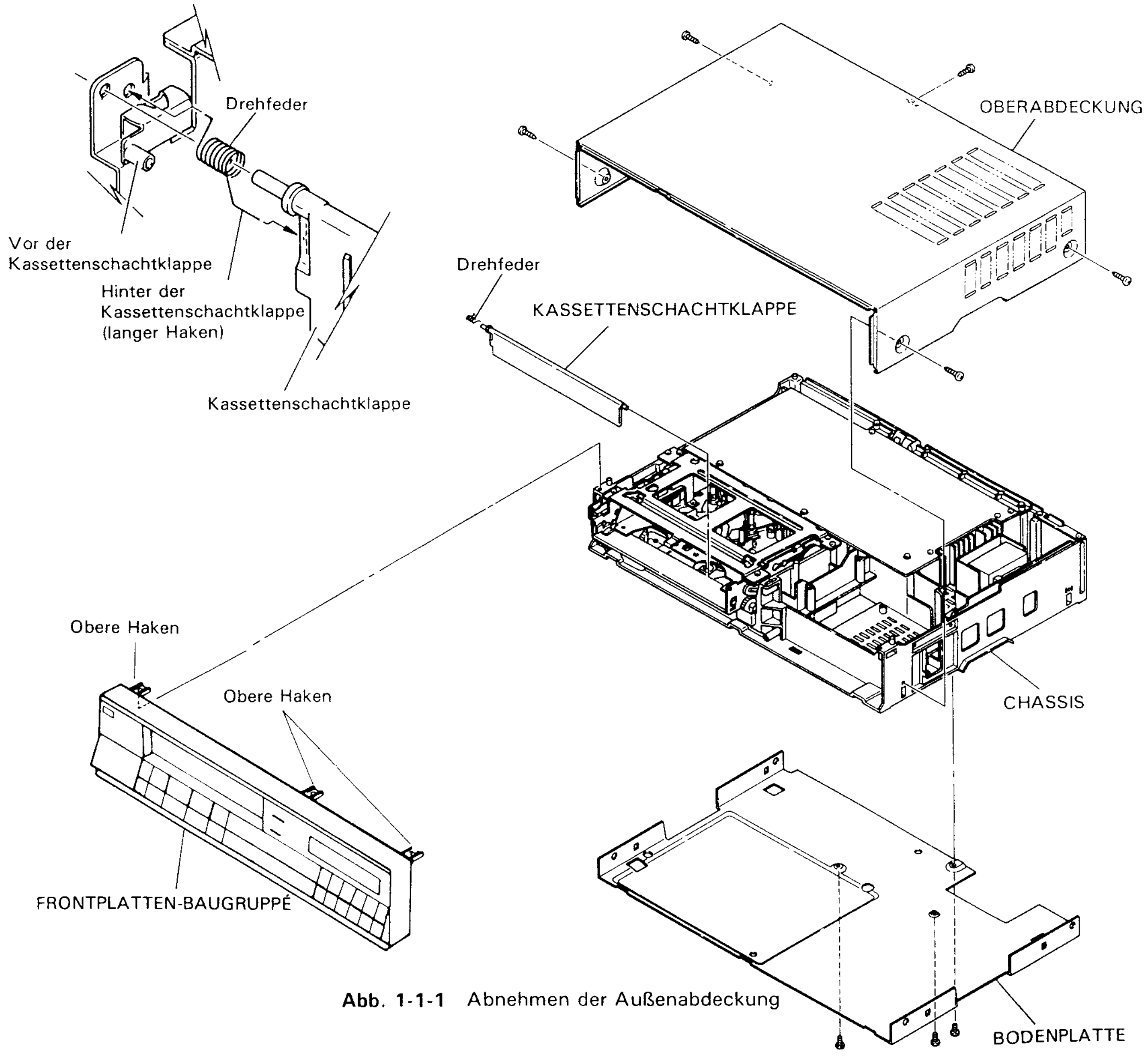

Drehfeder
Vor der Kassettenschachtklappe
Hinter der Kassettenschachtklappe (langer Haken)
Kassettenschachtklappe
OBERABDECKUNG
Drehfeder
KASSETTENSCHACHTKLAPPE
Obere Haken
Obere Haken
CHASSIS
FRONTPLATTEN-BAUGRUPPE
BODENPLATTE

**Abb. 1-1-1** Abnehmen der Außenabdeckung

## 1.1.4 Anordnung der Haupt-teile

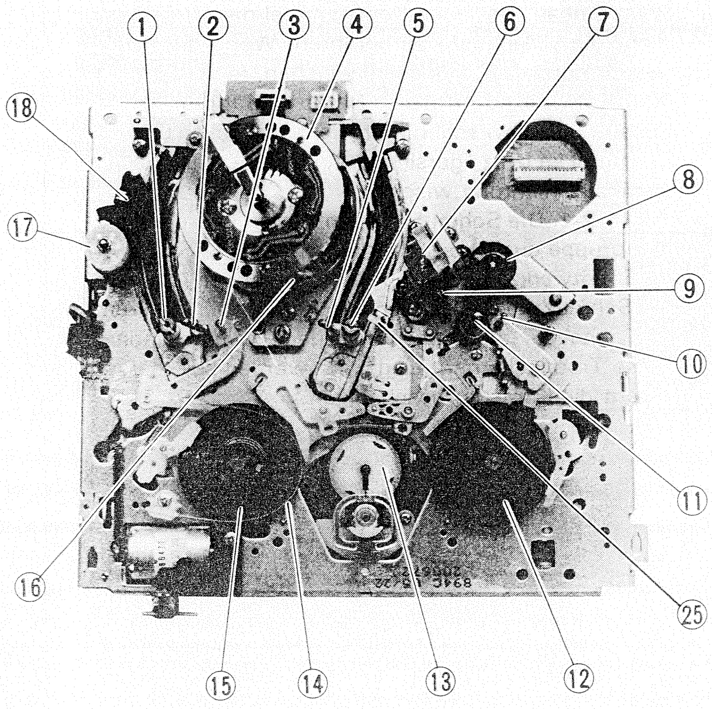


Abb. 1-1-2 Haupt-Deck von oben gesehen

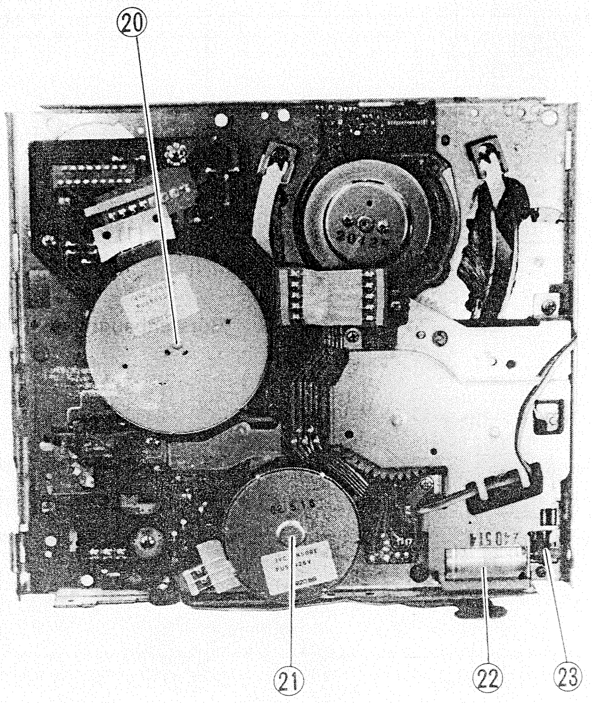


Abb. 1-1-3 Haupt-Deck von unten gesehen

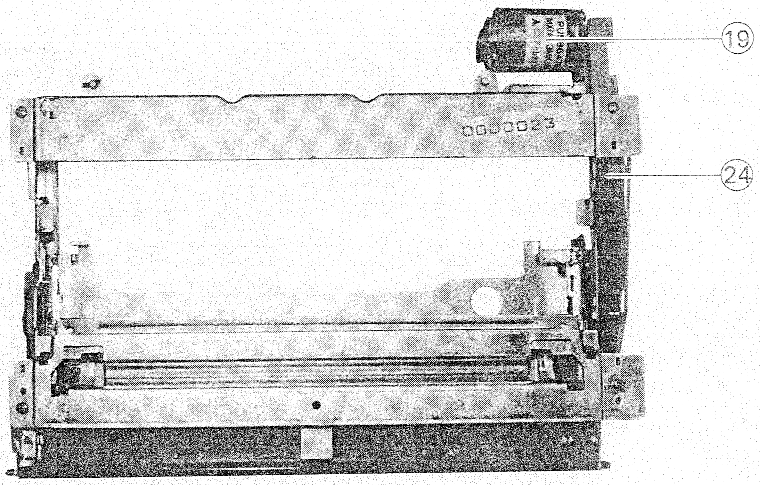
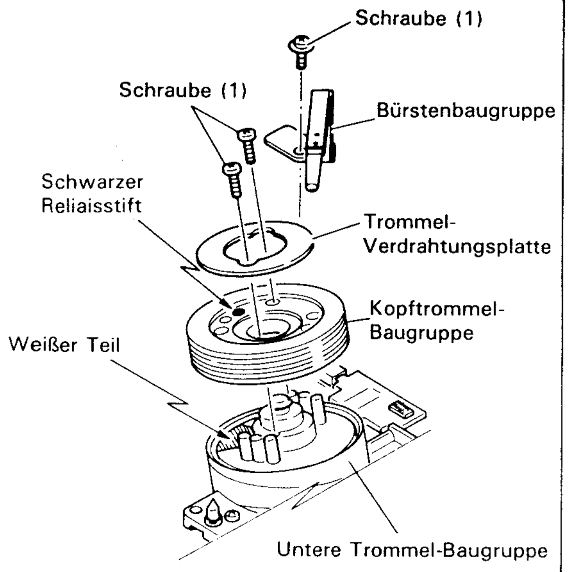
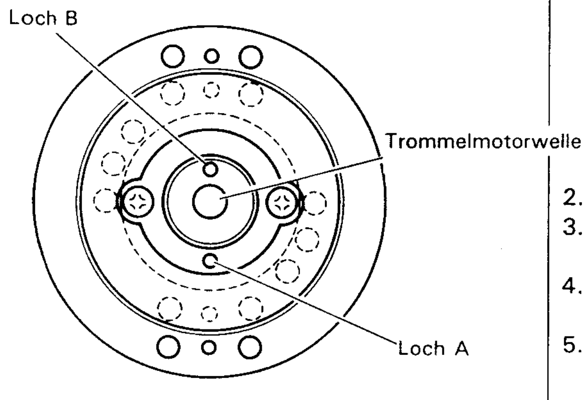
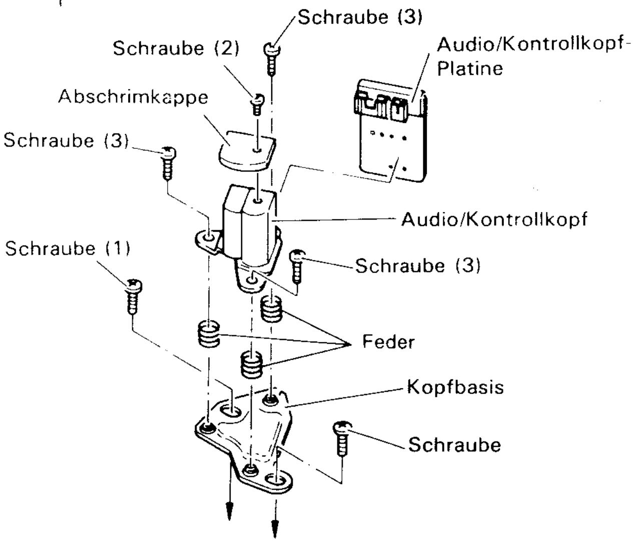
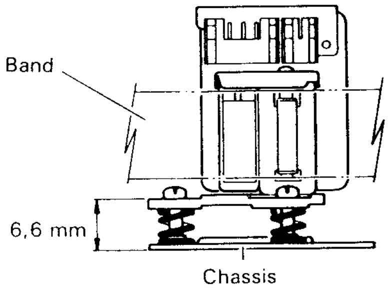


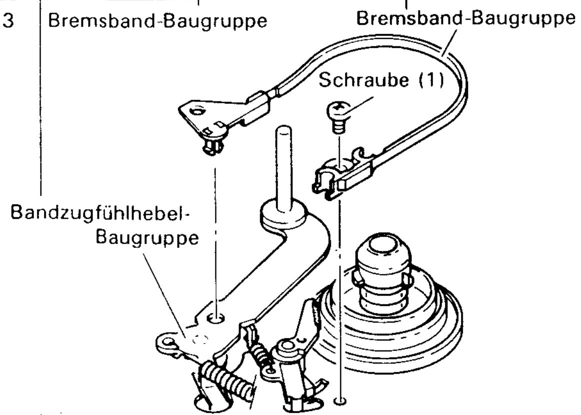
Abb. 1-1-4 Cassettenschacht

1. Abwickel-Führungsrolle
2. Abwickel-Kipprolle
3 Bandzugfühlstift
4. Kopftrommel
5. Aufwickel-Kippstift
6. Aufwickel-Führungsrolle
7. Audio/Kontrollkopf (A/C)
8. Andruckrolle
9. Aufwickel-Führungsstift
10. Führungsarm
11. Capstanwelle
12. Aufwickel-Bandteller
13. Spulenkupplung
14. Bremsband
15. Abwickel-Bandteller
16. Untere Trommel
17. Impedanzrolle
18. Vollöschkopf
19. Cassettenmotor
20. Capstanmotor
21. Spulenmotor
22. Betriebsartenmotor
23. Motorsteuerriemen
24. Cassettenriemen
25. Halbeinzugpol

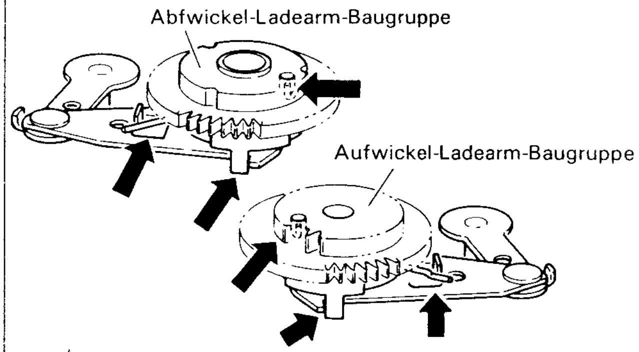
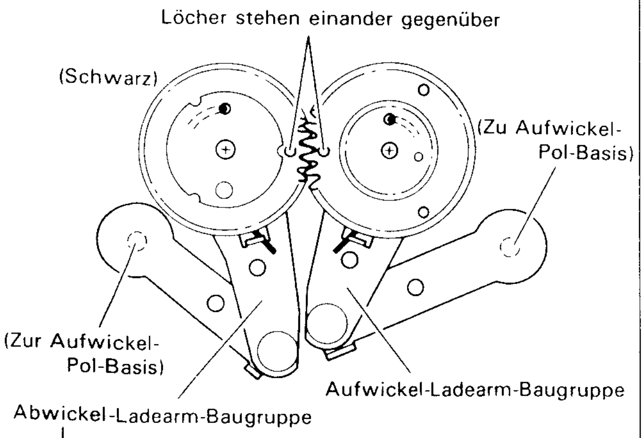
## 1.2 AUSTAUSCH DER HAUPTBAUGRUPPEN

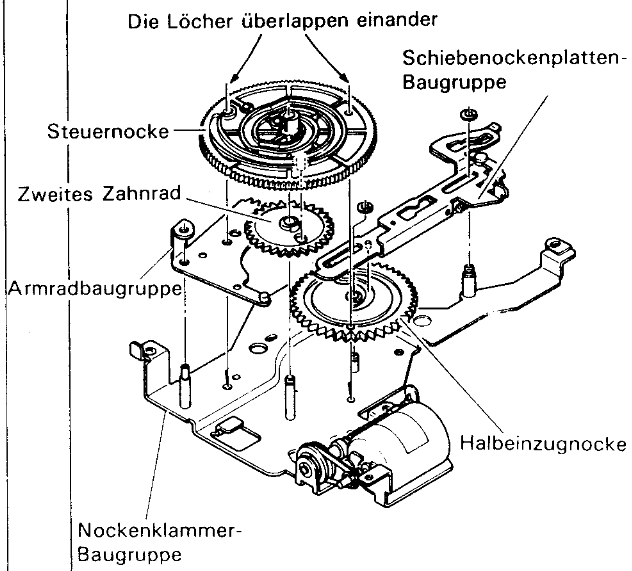
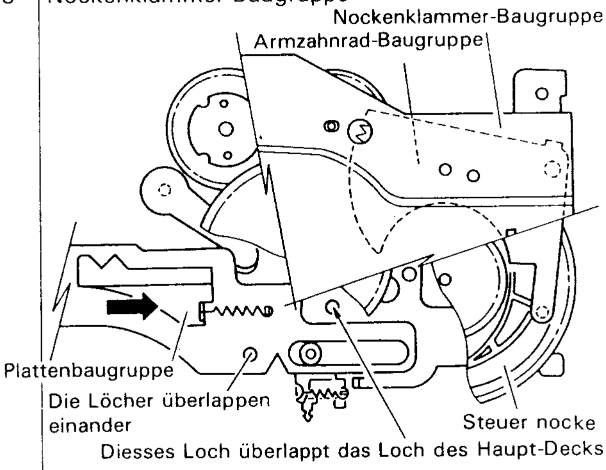
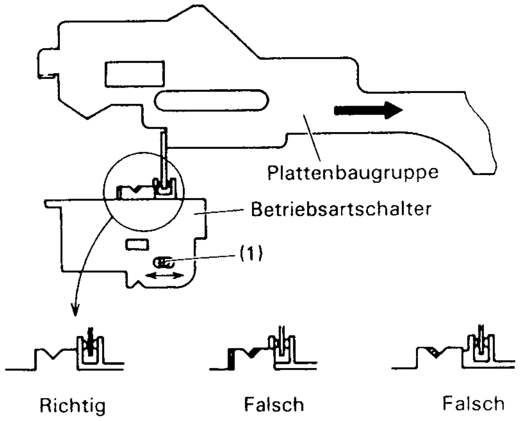
| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 1 | Ober Trommel<br>—Ausbau—<br><br> Schraube (1)<br>Schraube (1)<br>Bürstenbaugruppe<br>Schwarzer Relaisstift<br>Trommel-Verdrahtungsplatte<br>Kopftrommel-Baugruppe<br>Weißer Teil<br>Untere Trommel-Baugruppe<br>**Abb.1-2-1** Kopftrommel-Baugruppe | | | **Hinweis:** Beim Einbau der neuen Kopftrommel darauf achten, nicht die Videoköpfe zu berühren. Wenn die Köpfe verschmutzt sind, mit einem weichen, feinen und mit Alkohol befeuchteten Baumwollappen oder Fensterleder abwischen. Nur leicht andrücken und die Trommel im Uhrzeigersinn drehen. Auf keinen Fall in vertikaler Richtung wischen.<br>1. Siehe Abb. 1-2-1. Die Schraube (1) entfernen und dann die Bürstenbaugruppe ausbauen.<br>2. Mit einem Entlötwerkzeug die Kopftrommelplatinen freilöten.<br>3. Die beiden Schrauben (2) entfernen und die Kopftrommel zum Ausbauen anheben, zusammen mit der Trommelplatine. (Wenn diese Trommel erneut eingebaut werden soll, darauf achten, nicht die Köpfe zu beschädigen.) |
| | - Einbau —<br><br> <br>**Abb. 1-2-2** Polarität der Kopftrommel | | | 1. Eine neue Kopftrommelbaugruppe so einbauen, daß die schwarzen Relaisstifte der Kopftrommelbaugruppe über dem weiß gekennzeichneten Teil der unteren Trommelbaugruppe zu liegen kommen, wie in Abb. 1-2-1 gezeigt.<br>**Hinweis:** Immer die Kopftrommel richtig positionieren. Wie in Abb. 1-2-2 gezeigt, das Loch A der Kopftrommel gegenüber der Welle von Loch B der unteren Trommel plazieren. Vor dem Festziehen der Schrauben auf korrekte Position prüfen.<br>2. Die beiden Schrauben gleichmäßig festziehen.<br>3. Die Platine DRUM PWB auf die Kopftrommel setzen und festlöten.<br>4. Die Trommeleinmheit reinigen (besonders die obere Trommelbaugruppe).<br>5. Die Bürstenbaugruppe in Ausgangsstellung anbringen, und dann die Bürstengruppen-Halteschraube festziehen. |
| | — Prüfungen und Einstellungen — | | | Nach dem Einbau der Kopftrommel die folgenden Prüfungen und Einstellungen durchführen (siehe entsprechende Abschnitte dieser Anleitung).<br>1. FM-Wellenform<br>2. Servoschaltkreis<br>3. Videoschaltkreis |

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 2 | Audio/ Kontrollkopf (A/C)<br>—Ausbau—<br> Schraube (3)<br>Schraube (2)<br>Audio/Kontrollkopf-Platine<br>Abschrimkappe<br>Schraube (3)<br>Audio/Kontrollkopf<br>Schraube (1)<br>Schraube (3)<br>Feder<br>Kopfbasis<br>Schraube<br>(Zum Haupt-Deck)<br>**Abb. 1-2-3** Audio/Kontrollkopf | | | 1. Die an die Audio/Kontrollkopfplatine angeschlossenen Stecker abtrennen.<br>2. Zwei Schrauben (1) herausnehmen und den Audio/Kontrollkopf zusammen mit der Kopfbasis entfernen.<br>3. Die Audio/Kontrollkopfplatine freilöten und vom Audio/Kontrollkopf entfernen.<br>4. Die Schraube (2) herausnehmen und den Audio/Kontrollkopf von der Kopfbasis entfernen. Auf die drei Federn achten.<br>5. Die drei Schrauben (3) entfernen und den Audio/Kontrollkopf von der Kopfbasis abnehmen. Mit den drei Federn vorsichtig umgehen. |
| | - Einbau -<br> Band<br>6,6 mm<br>Chassis<br>**Abb. 1-2-4** Audio/Kontrollkopf-Höhe | | | 1. Den Audio/Kontrollkopf mit den gleichen Schritten wie oben aber in umgekehrter Reihenfolge montieren.<br>2. Provisorisch die Audio/Kontrollkopfhöhe über dem Chassis auf 6,6 mm einstellen (siehe Abb. 1-2-4). |
| | — Prüfungen und Justierungen — | | | 1. Mit einem Band (kein Abgleichband) den richtigen Betrieb des Bandtransports prüfen (siehe Kapitel 1.5).<br>2. Die Austauschbarkeit-Einstellung durchführen (siehe Kapitel 1.6). |

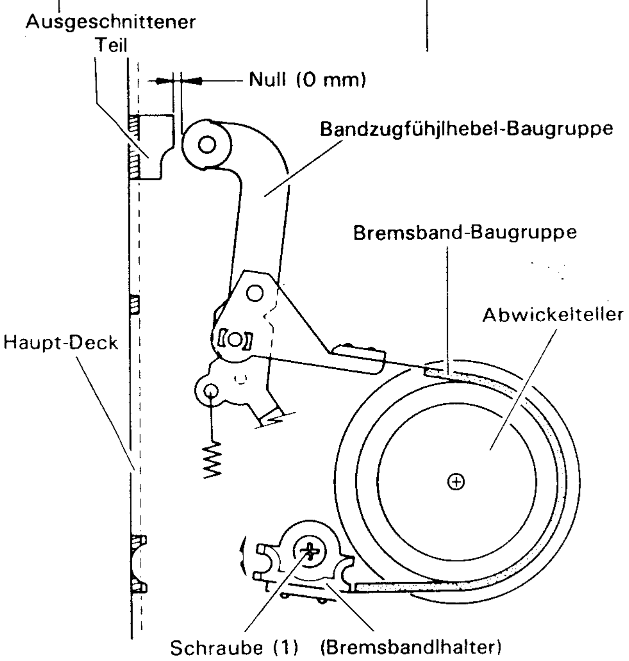
| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 3 | Bremsband-Baugruppe<br><br> Bremsband-Baugruppe<br>Schraube (1)<br>Bandzugfühlhebel-Baugruppe<br>Abb. 1-2-5 Bremsband-Baugruppe | | | 1. Die Schraube (1) herausnehmen und die Spannband-Baugruppe von der Spannarm-Baugruppe trennen (siehe Abb. 1-2-5).<br>2. Die Spannbandbaugruppe entfernen und austauschen.<br>3. Die Spannpolposition-Einstellung durchführen (siehe Kapitel 1.4). |

## 1.3 MONTAGE DES MECHANISMUS

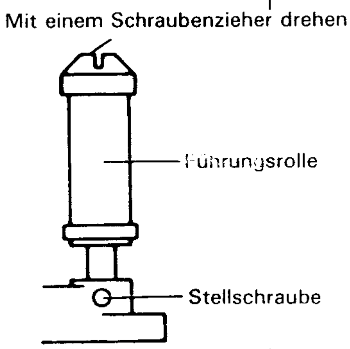
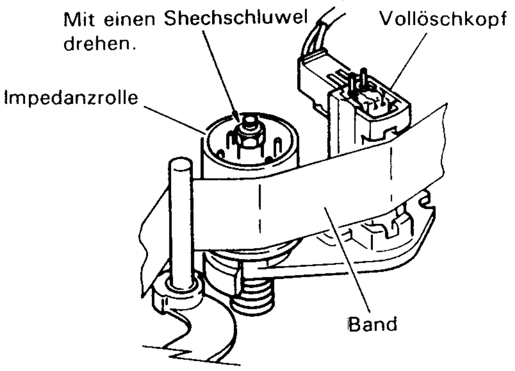
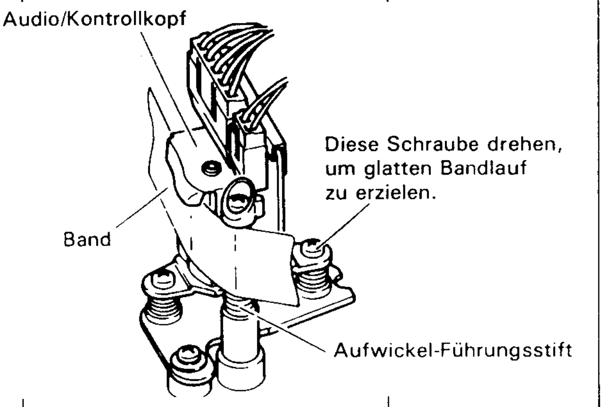
| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| | Eine enge Beziehung besteht zwischen dem Betriebsartenschalter und der Mechacon-Schaltung. Darum bestimmt der Betriebsartenschalter und der Kontrollarm die mechanische Funktion von Hebeln, Rädern, Walzen etc. Wenn diese Teile nicht richtig positioniert sind, blockiert die Mechanik in Stopp-Betriebsart. | | | |
| 1 | Ladearm-Baugruppe<br><br> Abfwickel-Ladearm-Baugruppe<br>Aufwickel-Ladearm-Baugruppe<br>**Abb. 1-3-1** Ladearm-Baugruppe (1)<br><br> Löcher stehen einander gegenüber<br>(Schwarz)<br>(Zu Aufwickel-Pol-Basis)<br>(Zur Aufwickel-Pol-Basis)<br>Aufwickel-Ladearm-Baugruppe<br>Abwickel-Ladearm-Baugruppe<br>**Abb. 1-3-2** Ladearm-Baugruppe (2) | | | Diese Baugruppen bestehen aus Aufnahmerädern, Drehfedern und Einzugarmen.<br>1. Unter Bezung auf Abb. 1-3-1 die Einzugarm-Baugruppen richtig montieren.<br>2. Die Stellungen von Aufnahmearm und Zuführarm im Hinblick auf die Einzuglöcher sind in Abb. 1-3-2 angegeben. Diese Konfiguration ist wichtig, um zum nächsten Betriebsvorgang umzuschalten. |

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 2 | Steuer nocke<br><br> Die Löcher überlappen einander<br>Schiebenockenplatten-Baugruppe<br>Steuernocke<br>Zweites Zahnrad<br>Armradbaugruppe<br>Halbeinzugnocke<br>Nockenklammer-Baugruppe<br>**Abb. 1-3-3** Steuer nocke | | | 1. Die Halbeinzugnocke auf der Nockenklammerbaugruppe montieren, und dann die Schiebenockenplatten-Baugruppe so anbringen, daß der Stutzen in die Rille auf den Halbeinzugnocken paßt.<br>2. Die Armradbaugruppe auf der Nockenklammerbaugruppe montieren.<br>3. Das zweite Rad und die Steuernocke so montieren, daß der Stutzen der Steuernocke in das Loch des zweiten Zahnrads paßt.<br>4. Die obige Baugruppe (Steuernocke und zweites Zahnrad) auf der Nockenklammer-Baugruppe so montieren, daß die in der Abbildung gezeigte Beziehung besteht.<br>5. Für den nächsten Schritt nicht die Steuernocke aus der Position drehen. |
| 3 | Nockenklammer-Baugruppe<br><br> Nockenklammer-Baugruppe<br>Armzahnrad-Baugruppe<br>Plattenbaugruppe<br>Die Löcher überlappen einander<br>Steuer nocke<br>Diesses Loch überlappt das Loch des Haupt-Decks<br>**Abb. 1-3-4** Nockenklammer-Baugruppe | | | 1. Unter Beachtung von Abb. 1-3-4 die Plattenbaugruppe so nach rechts drücken, daß das angezeigte Loch mit dem des Hauptdecks überlappt.<br>2. Dann die Nockenklammer-Baugruppe installieren.<br>**Hinweis:** Wenn Arm und Einzugräder nicht richtig eingreifen, mit ot einem Uhrmacher-Schraubenzieher oder ähnlichen Werkzeug beim Einbauen der Nockenklammer-Baugruppe die Getriebezähne einrasten. |
| 4 | Betriebsart-Umschaltstellung<br><br> Plattenbaugruppe<br>Betriebsartschalter<br>(1)<br>Richtig<br>Falsch<br>Falsch<br>**Abb. 1-3-5** Betriebsartschalter | | | 1. Die Plattenbaugruppe und den Betriebsartenschalter wie in Abb. 1-3-5 gezeigt einrasten lassen. Die Schraube (1) teilweise festziehen, bis der Punkt erreicht ist, wo der Schalter immer noch zum Einstellen der Position bewegt werden kann.<br>2. Die Plattenbaugruppe nach rechts drücken, bis der Punkt erreicht ist, wo die Löcher überlappen, wie in Abb. 1-3-4 gezeigt. Einen Uhrmacher-schraubenzieher einstecken, um die Löcher angeglichen zu halten.<br>3. Den Betriebsartenschalter bewegen, um die V-Kerbe wie in Abb. 1-3-5 gezeigt anzugleichen. Dann Schraube (1) zum Sichern festiziehen.<br>4. Den Uhrmacher-schraubenzieher entfernen, und dann die platine erneut einbauen und festlöten. |

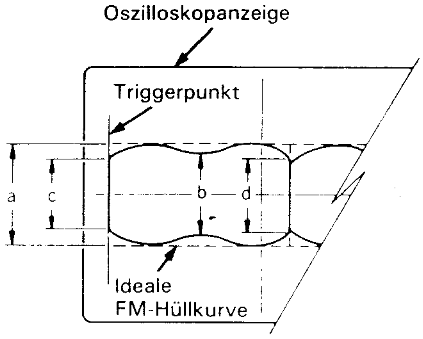
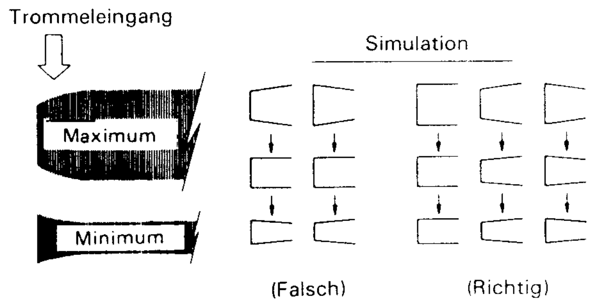
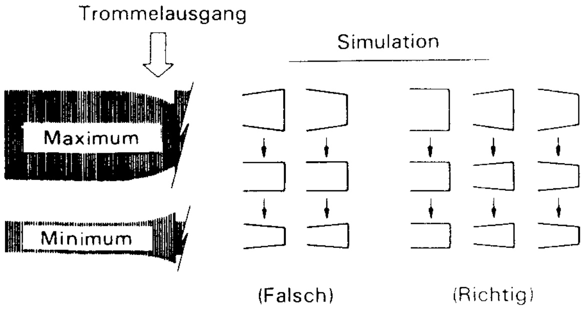
## 1.4 ANORDNUNG UND EINSTELLUNG

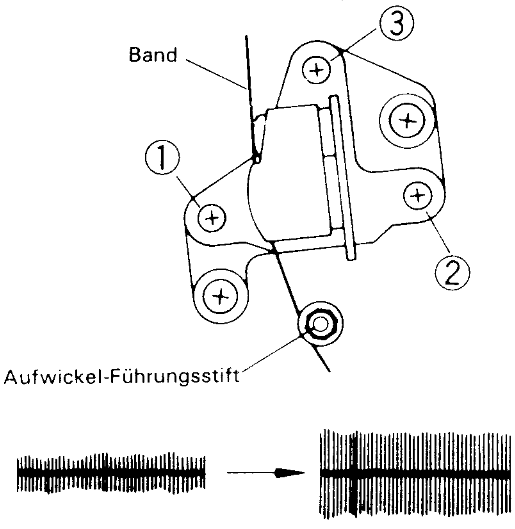
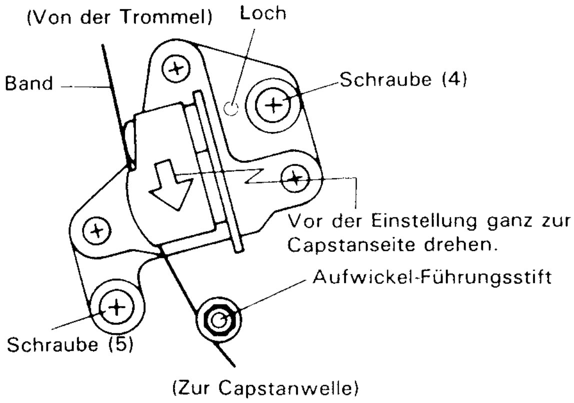
| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 1 | Bondzugfühlhebelposition<br><br> Ausgeschnittener Teil<br>Null (0 mm)<br>Bandzugführjlhebel-Baugruppe<br>Bremsband-Baugruppe<br>Abwickelteller<br>Haupt-Deck<br>Schraube (1)<br>(Bremsbandlhalter)<br>**Abb. 1-4-1** Bandzugfühstiftposition | | | 1. Ohne eingelegtes Kassettenband auf Wiedergabe-Betriebsart schalten (siehe Kapitel 1.1).<br>2. Unter Beachtung von Abb. 1-4-1 leicht die Schraube (1) lösen. Die Spannbandhalterposition auf 0 mm Abstand zwischen Spannarm und Ausschnittposition feststellen.<br>3. Die Schraube (1) festziehen, um den Spannbandhalter zu sichern.<br>4. Die Rückhalte-Kassettenlehre verwenden und auf Wiedergabe schalten.<br>5. Auf eine Skalenablesung von 25 bis 75 prüfen.<br>6. Wenn der Wert außerhalb dieses Bereichs liegt, die Spannband-Berührungsteile der Aufwickelspule mit Alkohol reinigen, oder den Zustand der Spannarmfeder prüfen. Wenn erforderlich, die Spannband-Baugruppe austauschen. |
| 2 | Aufwickel-Drehmoment | | | 1. Ohne eingelegtes Kassettenband auf Wiedergabe schalten (siehe Abschnitt 1.1).<br>2. Die Drehkraft-Meßuhr auf die Aufwickelspule setzen.<br>3. Die Drehkraft-Meßuhr leicht anfassen, so daß sie sich dreht, und den Wert ablesen, wenn die Skala der Anzeigenadel entspricht. Einen Wert zwischen 45 und 155 bestätigen.<br>4. Wenn der Wert außerhalb dieses Bereichs liegt, den Gummiteil des Leerlaufarms mit Alkohol reinigen oder wenn erforderlich die Spulenmotor-Treiberschaltung prüfen. |

## 1.5 PRÜFUNGEN UND JUSTIERUNGEN DES BANDTRANSPORTSYSTEMS

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| | Das Bandtransportsystem wurde ab Werk präzise eingestellt und braucht normalerweise nicht gewartet zu werden. Einstellung kann aber nach langem Einsatz oder nach dem Austausch von Teilen, die den Bandtransport beeinflussen, erforderlich werden. Die folgenden Schritte beschreiben Vorbereitungen für die Austauschbarkeit-Einstellungen von Kapitel 1.6. | | | |
| 1 | Führungsrollen<br><br> Mit einem Schraubenzieher drehen<br>Führungsrolle<br>Stellschraube<br>**Abb. 1-5-1** Führungsrolle | | | 1. Bei den Austauschbarkeit-Einstellungen wird die Führungswalze mit einem Schlitzschraubenzieher gedreht, um die Höhe und richtige Linearität der FM-Hüllkurve einzustellen. Einen metrischen Sechskantschlüssel (1,25 mm) verwenden, um die Stellschraube an der Basis der Führungsrolle leicht zu lösen (siehe Abb. 1-5-1). Die Stellschraube nur ausreichend lösen, um Drehung der Führungsrolle zu ermöglichen. Wenn zu lose gestellt wird, wird der Bandtransport zu unstabil, um richtige Einstellung zuzulassen. |
| 2 | Impedanzrolle<br><br> Mit einen Shechschluwel drehen.<br>Vollöschkopf<br>Impedanzrolle<br>Band<br>**Abb. 1-5-2** Impedanzrolle | | | 1. Dadurch wird die Bandlaufstabilität zwischen Kassette und Kopftrommel kompensiert. Nach dem Einstellen der Zuführwalze wird die Impedanzwalzenhöhe für glatten Bandtransport am unteren Flansch eingestellt.<br>2. Mit einem Mutterndreher (5,5 mm) die obere Mutter zum Einstellen drehen (siehe Abb. 1-5-2). Darauf achten, daß durch exzessives Drehen die Stabilität der FM-Hüllkurve gestört werden kann. |
| 3 | Audio/Kontrollkopf (A/C)<br><br> Audio/Kontrollkopf<br>Diese Schraube drehen, um glatten Bandlauf zu erzielen.<br>Band<br>Aufwickel-Führungsstift<br>**Abb. 1-5-3** Audio/Kontrollkopf | | | 1. Nach dem Einstellen der Aufwickelspule die Neigung des Audio/Kontrollkopfes für glatten Bandlauf am unteren Flansch des Aufnahmeführungspols einstellen. Siehe Abb. 1-5-3. |

## 1.6 AUSTAUSCHBARKEIT-PRÜFUNGEN UND EINSTELLUNGEN

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| | Vor der Verwendung von teurem Abgleichband ein Normalband verwenden und im Hinblick auf richtigen Bandtransport prüfen. | | | |
| 1 | FM-Hüllkurve<br>$\frac{b}{a} \geqq 0{,}7$, $\frac{c}{a} \geqq 0{,}5$ und $\frac{d}{a} \geqq 0{,}5$<br> Oszilloskopanzeige<br>Triggerpunkt<br>a<br>c<br>b<br>d<br>Ideale FM-Hüllkurve<br>**Abb. 1-6-1** FM-Hüllkurve<br> Trommeleingang<br>Simulation<br>Maximum<br>Minimum<br>(Falsch)<br>(Richtig)<br>**Abb. 1-6-2** Trommeleingang<br> Trommelausgang<br>Simulation<br>Maximum<br>Minimum<br>(Falsch)<br>(Richtig)<br>**Abb. 1-6-3** Trommelausgang | | | 1. Ein Oszilloskop an den Testpunkt FM OUT der Video-Wiedergabeschaltung anschließen. Das Oszilloskop extern mit dem Signal vom Trommel-Flipflop Testpunkt triggern (D-FF oder FF).<br>2. Das MH-2 Abgleichband abspielen und Tracking für maximale FM-Hüllkurve einstellen, siehe Abb. 1-6-1. Bestätigen, daß die Beziehung besteht, wie in der Abbildung für maximalen Aujsgang (a), minimalen Mittenausgang (b), minimalen Ausgant an der Trommelaufnahme (c) und minimalen Ausgang am Trommelauslaß (d) besteht.<br>3. Einstellung ist erforderlich, wenn die obigen Angaben nicht erfüllt werden. Auch wenn diese erfüllt werden, trotzdem prüfen, ob die FM-Hüllkurve insgesamt linear variiert. Wenn nicht, dann bewirkt leichte Variation in Tracking einen großen proportionalen Pegelabfall, der sich als Störung im Bild zeigt. In diesem Zustand darum mit den folgenden Prüfungen fortfahren und die Einstellungen wo erforderlich vornehmen.<br>4. Die Tracking-Einstellung zwischen minimalem und maximalem Ausgang der FM-Wellenform vornehmen. Den Teil der Wellenform beobachten, der dem Trommeleinlaß entspricht (siehe Abb. 1-6-2). Wenn Tracking eingestellt wird, sollte die geometrische Form dieses Teils der Hüllkurve konstant bleiben, auch wenn die Verstärkung zu- oder abnimmt.<br>Wenn sich die Form ändert, wie durch die Beispiele für "falsch" in der Abbildung gezeigt, eine sorgfältige Einstellung der Höhe der Zuführwalze vornehmen.<br>5. Anschließend den Teil der Hüllkurve untersuchen, der dem Trommelausgang entspricht (siehe Abb. 1-6-3), bei gleichzeitiger Spureinstellung. Auch hier sollte nur die Verstärkung variieren, aber nicht die Hüllkurvenform.<br>Wenn die Form variiert, wie in den Beispielen "falsch" in der Abbildung gezeigt, sorgfältig eine Einstellung der Höhe der Aufnahmeführungswalze vornehmen.<br>6. Die gesamte FM-Hüllkurve prüfen. Beide Führungswalzen fein einstellen, so daß die Variation so minimal und linear wie möglich ist.<br>7. Den Bandlauf an den Führungswalzen und Führungspolen beobachten.<br>Bestätigen, daß das Band nicht knittert oder verwellt.<br>Bestätigen, daß das Band richtig am unteren Flansch des Zuführführungspols entlangläuft. Sorgfältig die Höhe des Führungspols einstellen, wenn nötig. Diese Einstellung ist wichtig und beeinflußt die Wiedergabe der FM-Hüllkurve.<br>Wenn am Pol der Aufnahmespule Knittern oder Verwellung auftritt, sorgfältig die Neigung des Audio/Kontrollkopfes einstellen, so daß das Band richtig am unteren Flansch des Führungspols entlangläuft.<br>Schließlich die FM-Hüllkurve erneut prüfen. |

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 2 | Richtige Einstellung der Neigung des Audio/Kontrollkopfes ist wichtig, um guten Audioausgang und Signal/Rauschabastand zu gewährleisten. Starke Fehleinstellung kann Aufnahme des Kontrollsignals verhindern und Servo-Instabilität verursachen. Präzise Einstellung ist besonders für Modelle wichtig, die Band-Indexfunktion und Addressierfunktionen haben, denn diese arbeiten mit Kontrollsignalcodierung. Zum Beobachten des Audiosignals ein Oszilloskop an den Testpunkt der Audioschaltung anschließen (AUDIO OUT), oder direkt an den Audioausgang. In manchen Fällen kann es nützlich sein, den Ton mit Kopfhörern zu überwachen. | | | |
| 2 | Audio/Kontrollkopfeinstellung<br><br> ③<br>Band<br>①<br>②<br>Aufwickel-Führungsstift<br>Audiosignal<br>**Abb. 1-6-4** Audio/Kontrollkopf | | | 1. Das Treppenstufensignal (Audio 6 kHz) des MH-2 Abgleichbandes abspielen.<br>2. Die Schraube (3) (Abb. 1-6-4) einstellen, die die Azimuteinstellung für maximalen Ausgang darstellt.<br>3. Die Schrauben (1), (2) und (3) in kleinen und gleichen Stufen (jeweils um etwa 45°) drehen, um den Audio/Kontrollkopf auf maximalen Audioausgang einzustellen. Leicht die Höhe heben und senken, um maximale Ausgangsstellung zu bestätigen.<br>4. Die FM-Hüllkurve beobachten und die Einstellschrauben der Führungswalze festziehen. Darauf achten, nicht die Höheneinstellung zu ändern. Dann erneut die FM-Hüllkurve bestätigen. |
| 3 | Dadurch wird der Abstand zwischen Ton und Bild auf dem Band bestimmt. Richtige Einstellung ist wichtig, um Synchronisation von Bild und Ton im Programm zu erzielen. Die FM-Hüllkurve druch Anschluß eines Oszilloskops an den Video-Testpunkt (FM OUT) beobachten. Das Oszilloskop extern mit dem Trommel-Flipflop-Signal triggern. Einen Plus-Trigger (+) verwenden, um die Hüllkurve von CH-2 zu sehen. Die Tracking-Einstellung in neutrale Position (AUTO) stellen. | | | |
| 3 | Kontrollkopf-Phase (X-Wert)<br><br> (Von der Trommel)<br>Loch<br>Band<br>Schraube (4)<br>Vor der Einstellung ganz zur Capstanseite drehen.<br>Aufwickel-Führungsstift<br>Schraube (5)<br>(Zur Capstanwelle)<br>**Abb. 1-6-5** Kontrollkopf-Phaseneinstellung | | | 1. Das Treppenstufen-Signal des MH-2 Abgleichbandes abspielen.<br>2. Siehe Abb. 1-6-5. Leicht die Schrauben (4) und (5) lösen. Das Audio/Kontrollkopf-Positionierwerkzeug über die Schraube (4) setzen, wobei der Stift des Werkzeugs in das angezeigte Loch eingesetzt werden soll.<br>3. Das Werkzeug gegen den Uhrzeigersinn drehen, um den Audio/Kontrollkopf ganz in Kapstan-Richtung zu drehen.<br>4. Unter Beobachtung der CH-2 FM-Hüllkurve langsam das Werkzeug im Uhrzeigersinn drehen. In maximaler Ausgangsposition stoppen und die Schraube (5) festziehen. Das Werkzeug abnehmen und die Schraube (4) festziehen.<br>5. Die Tracking-Einstellung durchführen und bestätigen, daß die maximale FM-Hüllkurve in Neutral-Einstellung erzielt wird.<br>6. Wenn die FM-Ausgangsspitze nicht in der Neutralstellung für Tracking erzielt wird, den Audio/Kontrollkopf an der FM-Ausgangsspitze am nächsten zu dieser Stellung einstellen. |

| Nr. | Einstellung | Einstellpunkt | Betriebsart | Einstellschritte |
|---|---|---|---|---|
| 4 | Schlußprüfungen | | | 1. Ein Video- oder Fernsehsignal (Monochrom ist vorzuziehen) anlegen. Ein Reserveband verwenden, und aufnehmen und abspielen. Bestätigen, daß das FM-Wiedergabesignal den Parametern entspricht, die in Abb. 1-6-1 angegeben sind.<br>2. Die Prüfungen und, wenn nötig Einstellungen, des Kapitels Elektrische Einstellung für die Servo-, Video- und Audioschaltungen durchführen. |

# ABSCHNITT 2
# ELEKTRISCHE EINSTELLUNGEN

## 2.1 VORBEREITUNG

Elektrische Einstellungen sind erforderlich, nachdem Schaltkreisbauteile und bestimmte mechanische Teile ausgetauscht wurden.
Es ist wichtig, daß diese Einstellungen nur nach Beendigung aller Reparaturen und Austauschmaßnahmen durchgeführt werden. Diese Einstellungen außerdem nur vornehmen, wenn geeignete Ausrüstung zur Verfügung steht.

### 2.1.1 Erforderliche Prüfgeräte

1. Farbfernseher oder Monitor
2. Oszilloskop: Zweikanaloszilloskop mit verzögerter Zeitbasis
3. Frequenzzähler
4. Verzerrungsmesser
5. Rauschmesser
6. Audio-Oszillator
7. Audio-Voltmeter
8. Digital-Voltmeter
9. Signalgenerator: HF/ZF-Wobbler
10. Singalgenerator: PAL-Farbgenerator
11. Signalgenerator: Signalgenerator für Multiplex-Fernsehtonsignal
12. Aufnahmeband
13. Abgleichbänder: (MH-2)

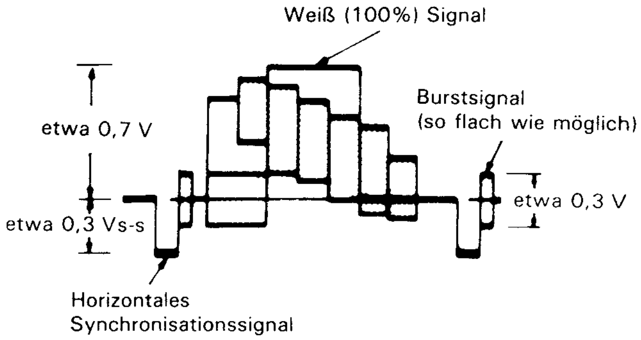

Weiß (100%) Signal
etwa 0,7 V
Burstsignal (so flach wie möglich)
etwa 0,3 V
etwa 0,3 Vs-s
Horizontales Synchronisationssignal

Abb. 2-1-1 Farbbalken vom Farbgenerator

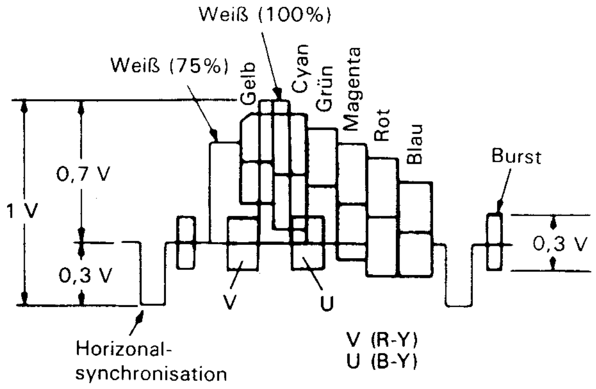

Weiß (100%)
Weiß (75%)
Gelb
Cyan
Grün
Magenta
Rot
Blau
Burst
0,7 V
1 V
0,3 V
0,3 V
V
U
Horizonal-synchronisation
V (R-Y)
U (B-Y)

Abb. 2-1-2 Farbbalkensignal-Hüllkurve

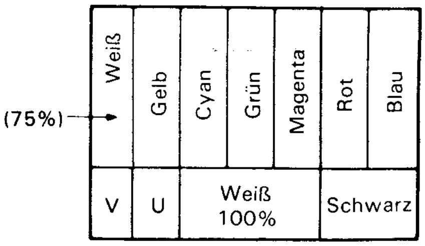

Weiß
Gelb
Cyan
Grün
Magenta
Rot
Blau
(75%)
V
U
Weiß 100%
Schwarz

Abb. 2-1-3 Farbbalken (MH-2)

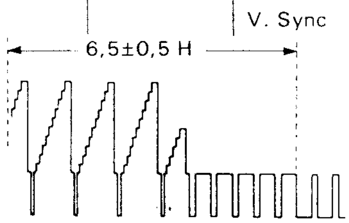
## 2.2 TIMER-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der TIMER-Platte.

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | Timer Clock | TP2 | C10 | • E-E | 1. Einen Frequenzzähler zwischen TP2 und GND schalten.<br>2. Zwischen GND und TP3 (TEST) kurzschließen und dann die Leitungen des Elektrolytkondensators C8 einmal kurzschließen, um IC1 rückzustellen.<br>3. C10 auf 2048,000 ±0,002 Hz einstellen (488,2808 bis 488,2818 µs) einstellen. |

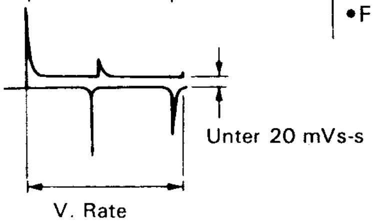
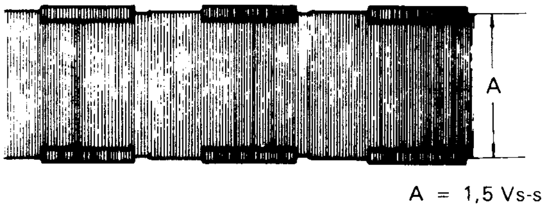
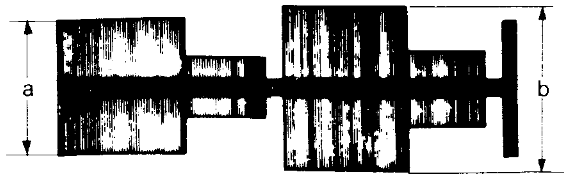
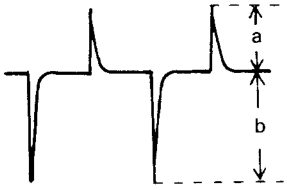
## 2.3 SERVO-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der MAIN-Platte.

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | PB Schaltpunkt | VIDEO OUT<br> <br>**Abb. 2-3-1** | R465 (CH-1) | • PB<br>• MH-2 Grautreppe<br>• Negative Triggerflanke (−)<br>• SP-Betriebsart | 1. Ein Oszilloskop an VIDEO OUT anschließen.<br>2. Das Treppenstufensegment des MH-2 Abgleichbandes abspielen.<br>3. Das Oszilloskop extern mit dem Signal von TP411 (DRUM FF) triggern (-Flanke).<br>4. R465 einstellen, um den Triggerpunkt 6,5 ±0,5 H von V. sync. zu positionieren. |
| 2 | Slow Tracking | Monitor | R478 | • Zeitlupe<br>• SP-Betriebsart | 1. Den Tracking-Regler vorne durch gleichzeitiges Drücken der Tasten + und − in Mittenstellung stellen.<br>2. Ein Farbbalkensignal in SP-Betriebsart aufzeichnen und dann in Zeitlupe wiedergeben.<br>3. R478 einstellen, um Rauschbalken im Monitor-Fernseherdisplay zu minimieren. |
| 3 | X2 Tracking | Monitor | R414 | • X2 Wiedergabe<br>• SP-Betriebsart | 1. Den Tracking-Regler in Mittenstellung stellen.<br>2. Das Farbbalkensignal mit doppelter Geschwindigkeit abspielen.<br>3. R414 einstellen, um die Rauschbalken im Monitor-Fernseherdisplay zu minimieren. |
| 4 | V. Impulsposition (V. LOCK) | Monitor | R416 | • REC und dann PB<br>• Still-Betriebsart<br>• Farbbalken | 1. Ein Farbbalkensignal aufzeichnen, und dann in Standbildbetriebsart wiedergeben.<br>2. Den Monitor beobachten und R416 auf minimales vertikales Zittern einstellen. |

## 2.4 VIDEO-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der MAIN-Platte.

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | Y NR<br>(NC BAL) | TP121<br> <br>**Abb. 2-4-1** | R112 | •REC und dann PB<br>•Farbbalken | 1. Ein Farbbalkensignal aufzeichnen, und dann wiedergaben und dabei ein Oszilloskop an TP121 anschließen.<br>2. Wie in der Abbildung gezeigt R112 auf minimalen Unterschied im DC-Schritt einstellen. |
| 2 | REC FM Pegel | TP2<br>(Pre/rec)<br> <br>**Abb. 2-4-2** | R204 | •REC<br>•Barbbalken<br>•SP-Betriebsart | 1. Ein Farbbalken-Eingangssignal anlegen.<br>2. Ein Oszilloskop an TP2 anschließen.<br>3. R204 so einstellen, daß der Austastpegel der vertikalen Austastung 1,5 Vs-s ±0,2 Vs-s wird.<br>**Hinweis:** Dia Oszilloskop-Erdung an die Abschirmung anschlißen. |
| 3 | SP REC<br>Farbpegel und Balance | TP304<br>•<br> <br>**Abb. 2-4-3** | R321 | •PB<br>•MH-2 Farbbalken<br>•SP-Betriebsart<br>•REC und dann PB<br>•Farbbalken<br>•SP-Betriedart | 1. Ein Oszilloskop an TP304 anschließen. Das Farbbalkensegment von MH-2 abspielen und dén Farbsignalpegel beobachten.<br>2. Durch Drücken der Tasten – und + der Tracking-Regelung an der Frontplatte auf maximalen Pegel der Farb-FM-Hüllkurve einstellen und den höchsten Farbpegel markieren.<br>3. Den Tracking-Regler an der Frontplatte in Mittenposition stellen, durch gleichzeitiges Drücken der Tracking-Regler + und –.<br>4. Ein Farbbalkensignal aufzeichnen und wiedergeben. Wenn nötig, vor der Aufnahme R321 einstellen, so daß der höhere Kanal 90% des bei Wiedergabe aufgezeichneten, Pegels wird. Zu diesem Zeitpunkt bestätigen, daß der Kanalunterschild innerhalb von 3 dB liegt. |
| 4 | SECAM<br>DETECTOR | TP351<br> <br>**Abb. 2-4-4** | L353 | •SECAM Farbbalken<br>•E-E | 1. Ein SECAM-Farbbalkensignal an Video IN anlegen.<br>2. Ein Oszilloskop an TP351 anschließen.<br>3. L353 einstellen, um a:b = 3:4 zu erhalten. |
| 5 | PB FM<br>Equalizer | MONITOR | R127<br>(PB FM EQ) | •REC und dann PB<br>•Fernsehsendung | 1. Eine Farbsendung aufzeichnen und anschließend wiedergeben, welche ein Portrait zeigt.<br>2. R127 so einstellen, daß die Gesichtszüge auf dem Farbmonitor gut erkennbar sind. |

### 2.5 AUDIO-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der AUDIO-Platte.

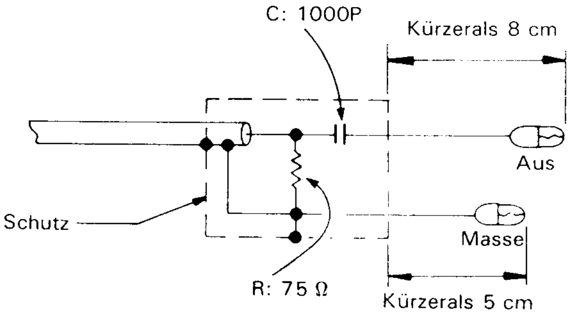
| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | Vormagnetisierung | TP31,<br>TP32 | R9 | • SOURCE-Einstellung: AUX<br>• SP-Betriebsart<br>• REC<br>• Kein Signal | 1. Ein Millivoltmeter zwischen TP31 und TP32 schalten.<br>2. Auf REC-Betriebsart ohne Signal schalten.<br>3. R9 auf 2,2 mVrms einstellen. |
| 2 | Audio PB pegel | AUDIO AUSG. | R28 | • SOURCE-Einstellung: AUX<br>• REC und dann PB<br>• Betriebsart SP oder LP<br>• – 8 dBs/1 kHz | 1. Ein Oszilloskop an AUDIO OUT anschließen.<br>2. Ein Audiosignal (– 8 dBs/1 kHz) an den AUDIO EING. Anschluß anschließen und dann zusammen mit dem Videosignal aufzeichnen und anschließend abspielen.<br>3. R28 einstellen, um – 6 dBs Audioausgang zu erhalten. |

### 2.6 ZF-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der ZF-Platte.

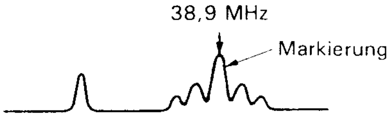
**Erforderliche Ausrüstung:**

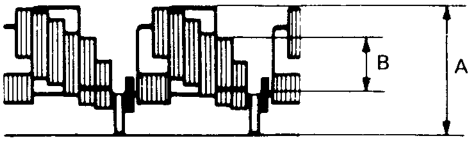
1. Oszilloskop
2. IF-Wobbelgenerator mit geeigneten Marken (PIF, SIF, USW.)
3. Wobbelsonde (Wobbelsignalkabel) wie unten gezeigt.



Wobbelsonde

**Abb. 2-6-1**

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | VCO<br><br> <br>VCO und wobbelsignal<br>**Abb. 2-6-2** | IC1-28 | T2 (VCO) | • Wobbelgenerator aus: 70 dB$\mu$ (38,9 MHz)<br>• Tuner-Betriebsart ohne Antenne IN | 1. Eine Wobbelsonde wie in Abb. 2-6-1 gezeigt verwenden und den Wobbelgeneratorausgang an Pin 2 von SAW 1 anschließen.<br>Die Wobbelverstärkung so einstellen, daß die Hüllkurve nicht verzerrt wird, wie im Oszilloskop gezeigt.<br>Ein Oszilloskop an Pin 28 von IC1 (VIDEO DET OUT) anschließen und T2 so einstellen, daß die Hüllkurve mit der Frequenzmarkierung wie in Abb. 2-6-2 gezeigt übereinstimmt. |
| 2 | IF Adj. | IC1-28 | IF-Kern in Frontstufe | • Wobbelgenerator aus: 70 dB$\mu$ (38,9 MHz)<br>• Tuner-Betriebsart ohne Antenne IN | 1. Eine Wobbelsonde wie in Abb. 2-6-1 gezeigt verwenden und den Wobbelgeneratorausgang an TP der Frontstufe (TUNER) anschließen.<br>2. Ein Oszilloskop an Pin 28 von IC1 anschließen. IF Kern der Frontstufe so einstellen, daß die Markierung für 38,9 MHz Maximalpegel erreicht. |
| 3 | RF AGC | IF-Klemme der Frontstufe | R21 | • Fernsehsignal<br>• Tunerbetriebsart | • **Vor Durchführung der folgenden Anschlüsse:**<br>1. Ein Kabel an ANT IN anschließen und TV OUT bei 75 Ohm terminieren.<br>2. Den Fernsehkanalsignalgenerator wie folgt einstellen.<br>Video: 65 dB$\mu$/75 Ohm, Farbbalken 87,5% Modulation.<br>Audio: 55 dB$\mu$/75 Ohm, 1 kHz ±50 kHz Abweichung.<br>1. Ein Oszilloskop an die Klemme des U/V Tuners (Frontstufe) anschließen. R21 auf Maximalpegel einstellen, und dann erneut R21 auf 6,5 dB Verstärkung einstellen. |

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 4 | Farbpegel<br><br> <br>B: magenta A:B= 1:0.48<br>Abb. 2-6-3 | JP1-12 (VIDEO OUT) | R40 | •Fernsehsignal<br>•Tunerbetriebsart<br>•Farbbalken | 1. Ein Farbbalakensignal empfangen. Den Y-Pegel auf 100% Vergleichssignal einstellen und dann R40 auf einen Magentapegel von 48% beim Videoausgang einstellen. |

## 2.7 DEMODULATOR-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der DEMODULATOR-Platte.

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | Erste Audio-Detektorspule | IC1 Pin 3 | T4 (ZF-platte) | •Betriebsart BILING (Zweitsprache)<br>•SUB: nicht moduliert<br>•MAIN: moduliert | 1. Das modulierte MAIN-Audiosignal an die IF-Klemme der Frontstufe anlegen.<br>2. Den Verzerrungsmesser an IC1 Pin 3 anschließen.<br>3. T4 der ZF-platte auf minimale Verzerrung einstellen.<br>**Hinweis:** Der Anschluß des Audio-Multiplex-Fernsehsignalgenerators entspricht den folgenden Einstellungen. |
| 2 | Zweite Audio-Detektorspule | IC1 Pin 2 | T1 | •Betriebsart BILING (Zweitsprache)<br>•SUB: moduliert<br>•MAIN: nicht moduliert | 1. Den Verzerrungsmesser an IC1 Pin 2 anschließen.<br>2. T1 auf minimale Verzerrung einstellen. |
| 3. | Stereokanaltrennung | IC1 Pin 5 | R2 | •STEREO-Betriebsart<br>•R: moduliert<br>•L: nicht moduliert | 1. Den Signalgenerator auf Stereo stellen, aber nur den R-Kanal einstellen.<br>2. Ein Oszilloskop an IC1 Pin 5 anschließen.<br>3. R2 auf minimalen Ausgang einstellen. |
| 4 | Summen | CN2 Pin 2 | T8, T2 (ZF-platte) | •STEREO-Betriebsart<br>•R/L nicht moduliert | 1. Einen Rauschmesser an CN2 Pin 2 anschließen.<br>2. Die ZF-platte T8 auf minimales Philips-Rauschen einstellen.<br>3. Die ZF-platte T2 auf minimales Flächenauflockerung-Rauschen einstellen. |
| 5 | Audio-Ausgangspegel | CN2-2 Pin (L)<br>CN2-4 (R) | R21 (L)<br>R24 (R) | •STEREO-Betriebsart<br>•R moduliert/ nicht moduliert<br>•L nicht moduliert/ moduliert | 1. Den Signalgenerator auf Stereo stellen.<br>2. Einen Rauschmesser CN2 Pin 2 anschließen.<br>3. R21 (L-Kanal) auf −18,0 ±0,5 dBs einstellen.<br>4. Auf gleiche Weise einen Rauschmesser an CN2 Pin 4 anschließen ud R24 für den R-Kanal einstellen. |

## 2.8 SWITCHING REGULATOR-SCHALTUNG

**Hinweis:** Falls nicht anders angegeben, befinden sich alle Meß- und Einstellpunkte auf der SWITCHING REGULATOR-Platte.

| Nr. | Einstellung | Meßpunkt | Einstellpunkt | Betriebsart Eing.-Signal | Einstellschritte |
|---|---|---|---|---|---|
| 1 | Ausgangsspannung | CN1 Pin 1 | R9 | •Eingeschaltet | 1. Ein digitales Voltmeter zwischen CN1 Pin 1 und GND schalten.<br>2. R9 auf 15,3 ±0,1 V Gleichspannung einstellen. |